Lord Howe Island Critical Infrastructure Project

Biodiversity Development Assessment Report

APP Corporation Pty Ltd

26 September 2025

Final

cumberland ecology

PART OF SLR

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The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or recommendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

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Date:	26 September, 2025

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Glossary

Term	Definition
AOBV	Area of Outstanding Biodiversity Value
Assessment Area	1500 m buffer around the subject land
BAM	Biodiversity Assessment Method
BAM-C	BAM Calculator
BC Act	NSW *Biodiversity Conservation Act 2016*
BC Regulation	NSW *Biodiversity Conservation Regulation 2017*
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	Biosecurity Act 2015
BMP	Biodiversity Management Plan
Bonn Convention	Convention on the Conservation of Migratory Species of Wild Animals
BOS	Biodiversity Offsets Scheme
CAMBA	China–Australia Migratory Bird Agreement
CEEC	Critically Endangered Ecological Community
Commonwealth DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
CSSI	Critical State Significant Infrastructure
DPHI	Department of Planning, Housing and Infrastructure
'E'	Endangered
EP&A Act	*NSW Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FFA	Flora and Fauna Assessment
ha	hectares
IBRA	Interim Biogeographic Regionalisation for Australia
JAMBA	Japan–Australia Migratory Bird Agreement
km	Kilometre
LHIB	Lord Howe Island Board
Locality	5km radius of the subject land
'm'	Metres
MNES	Matters of National Environmental Significance
North Zone	Area that will comprise marine and land-based infrastructure, including a freight handling facility, a piled vessel ramp and biosecurity infrastructure
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
PCT	Plant community types

Term	Definition
PMST	Protected Matters Search Tool
Project	The construction, operation and maintenance of new marine infrastructure, cargo handling facility, biosecurity infrastructure and waste management facility on Lord Howe Island, and associated landscape and vegetation restoration
Project Area	Two western areas on Lord Howe Island subject to the Project
ROKAMBA	Republic of Korea–Australia Migratory Bird Agreement
SAII	serious and irreversible impacts
SEARs	Secretary's Environmental Assessment Requirements
South Zone	Area that will comprise the WMF, dog kennels and fuel bowsers
SSI	State Significant Infrastructure
Study Area	Areas of land subject to detailed terrestrial biodiversity surveys
subject land	land directly impacted by the Project comprising both the construction footprint and the operational footprint
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened ecological community
WM Act	NSW *Water Management Act 2000*
WMF	Waste Management Facility
'V'	Vulnerable

Declarations

i. Certification of Biodiversity Development Assessment Report

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method (BAM) and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act).

Name: Matthew Freeman

Signature:

Date: 26/09/2025

BAM Assessor Accreditation no: BAAS19019

This Biodiversity Development Assessment Report (BDAR) has been prepared to meet the requirements of BAM 2020 where possible.

ii. Conflict of Interest

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest in the preparation of this Biodiversity Development Assessment Report (BDAR).

Name: Matthew Freeman

Signature:

Date: 26/09/2025

BAM Assessor Accreditation no: BAAS19019

iii. Authors and Contributors

This document has been prepared by Matthew Freeman (BAM Accredited Assessor No: BAAS19019) with assistance from personnel as outlined in Table 1.

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1. Introduction

1.1. Project Overview

The NSW Department of Climate Change, Energy, the Environment and Water ('NSW DCCEEW' or 'Proponent'), on behalf of the Lord Howe Island Board (LHIB), proposes the construction, operation and maintenance of new marine infrastructure, cargo handling facility, biosecurity infrastructure and waste management facility on Lord Howe Island, and associated landscape and vegetation restoration.

The Proponent seeks development consent for the Project as Critical State Significant Infrastructure (CSSI) under Division 5.2, subdivision 5.13 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project is a controlled action (2025/10188) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) and will be assessed under the bilateral agreement between the NSW and Commonwealth Governments.

The Project is part of the broader Lord Howe Island Critical Infrastructure Program; however, the aspects being considered within this report comprise the construction, operation and maintenance of the following on Lord Howe Island:

- Freight handling facility which includes new and upgraded marine infrastructure (new piled vessel ramp and upgraded jetty and existing boat ramp), boat wash down and maintenance area, cargo loading/offloading areas, biosecurity infrastructure, adaptive reuse of the 'Old Cargo Shed' and 'Ocean View' heritage buildings, viewing area, picnic area, landscaping, retaining walls, amenities and vehicle and boat trailer parking;
- Waste management facility (WMF) upgrades which include new storage sheds and materials processing facilities (including for organic material), wastewater treatment plant and waste receival area (including chemical and hazardous waste), hardstand and roads, staff office, and selective dune restoration at the existing WMF;
- Dedicated dog kennels to house detection dogs; and
- Self-service fuel bowser along Old Lagoon Road.

The Project will include works within two western areas on Lord Howe Island referred to collectively as the 'Project Area'. Within the Project Area, a terrestrial study area ('study area') has been identified, which includes two areas referred to hereafter as the 'North Zone' and 'South Zone'. The North Zone includes marine and land-based infrastructure, including a freight handling facility, a piled vessel ramp and biosecurity infrastructure. The South Zone includes the WMF, dog kennels and a fuel bowser. A terrestrial disturbance area for the development footprint of the proposed built infrastructure has also been identified within the study area which includes all areas directly impacted by the Project during construction and operation and referred to hereafter as the 'subject land'. A site map and location map have been prepared in accordance with the BAM and are presented in Figure 1 and Figure 2, respectively. The layout of the Project is shown in Figure 3 and Figure 4.

Secretary's Environmental Assessment Requirements (SEARs) were issued by the Department of Planning, Housing and Infrastructure (DPHI) on 14 April 2025. Following the Referral decision issued by the

Commonwealth Department of Climate Change, Energy, the Environment and Water (Commonwealth DCCEEW), and identification of the assessment approach under the Bilateral Agreement, the DPHI issued Supplementary SEARs on 8 August 2025 which included the assessment of MNES in accordance with the Referral decision.

In accordance with the Project SEARs, SLR Consulting Australia Pty Ltd (SLR; now a parent company for Cumberland Ecology) has prepared this Biodiversity Development Assessment Report (BDAR) on behalf of the Proponent to assess the terrestrial biodiversity impacts of the Project.

The study area includes marine environments within the lagoon, which adjoin the North and South Zones. Impacts to fauna in the lagoon are not assessed by this BDAR but are covered in the Coastal and Marine Ecological Assessment (O2 Marine, 2025).

1.2. Requirement for a BDAR

The Project is classified as CSSI under Division 5.2, subdivision 5.13 of the EP&A Act. Under the NSW *Biodiversity Conservation Act 2016* (BC Act), all State Significant Infrastructure requiring development consent under Part 5 of the EP&A Act must be assessed using the Biodiversity Assessment Method (BAM) with the results presented in a BDAR, unless a BDAR waiver is granted. A waiver has not been sought for the Project, and therefore this BDAR has been prepared to accompany the Environmental Impact Statement (EIS) for the Project.

1.3. Purpose

The purpose of this BDAR is to document the findings of an assessment undertaken for the Project in accordance with Stage 1 (Biodiversity Assessment) and Stage 2 (Impact Assessment) of the BAM.

Specifically, the objectives of this BDAR are to:

- Identify the landscape features and site context (native vegetation cover) within the subject land and assessment area;
- Assess native vegetation extent, plant community types (PCTs), threatened ecological communities (TECs) and vegetation integrity (site condition) within the subject land;
- Assess habitat suitability for threatened species that can be predicted by habitat surrogates (ecosystem credits) and for threatened species that cannot be predicted by habitat surrogates (species credit species);
- Identify potential prescribed biodiversity impacts on threatened species and communities;
- Describe measures to avoid and minimise impacts on biodiversity values and prescribed biodiversity impacts during project planning;
- Describe impacts to biodiversity values and prescribed biodiversity impacts and the measures to mitigate and manage such impacts;
- Identify the thresholds for the assessment and offsetting of impacts, including:
    - Impact assessment of potential entities of serious and irreversible impacts (SAII);

- Impacts for which an offset is required;
- Impacts for which no further assessment is required;

- Describe the application of the no net loss standard, including the calculation of the offset requirement.

However, as outlined in Section 1.5 of the BAM (2020a), the BAM does not apply to biodiversity that is endemic to Lord Howe Island and therefore a number of sections within this BDAR cannot be prepared in accordance with the BAM. In particular, PCTs have not been identified on Lord Howe Island and therefore it is not possible to use the BAM Calculator (BAM-C) to determine vegetation integrity scores, identify ecosystem and species credit species or calculate offset requirements in accordance with the Biodiversity Offsets Scheme (BOS). Furthermore, a number of components required under the BAM such as the identification of native vegetation cover, patch size and vegetation zones are not required as these are used in the BAM-C to assess vegetation integrity and habitat suitability for threatened species. Nevertheless, these components have been completed where possible. Where sections of this BDAR cannot be prepared, relevant information has been provided to assess biodiversity values, including references to the Flora and Fauna Assessment (FFA) provided in **Appendix A**, which includes further assessment of the Project on biodiversity within the Project Area.

Furthermore, the threatened and migratory species listed in the Referral decision have been assessed in this BDAR, with additional information also provided within **Appendix B**.

1.4. Identification of the Development Site Footprint

The development site footprint comprises 5.26 ha of land directly impacted by the Project and is referred to within this BDAR as the 'subject land'. The development site footprint comprises both the construction footprint and the operational footprint of the Project. The construction footprint is greater than the operational footprint and includes all areas required for construction as well as areas required for remediation. This assessment focuses on the construction footprint as it includes the total area of land subject to direct impacts from the Project. The operational footprint falls within the construction footprint, and only includes areas required for the future operational phases of the Project. Areas subject to remediation and landscaping within the construction footprint are excluded from the operational footprint. The development site footprint (i.e. subject land), including the construction and operation footprints, are shown in Figure 2.

A wider 'study area' has also been identified which includes all areas of land subject to detailed terrestrial biodiversity surveys, including vegetation mapping, plot surveys and targeted threatened and migratory species surveys. The wider study area is shown in **Figure 1** and **Figure 2**.

1.5. General Description of Lord Howe Island and the Subject Land

The focus of the BDAR is on terrestrial habitats within the subject land located on the western edge of Lord Howe Island, which is part of a group of islands in the southern Pacific Ocean. Prior to human settlement, the biota of this island group existed and evolved in relative isolation with the result that there is a high proportion of endemic species, and migratory species of high conservation values. The Lord Howe Island Group has World Heritage status because of its diverse and unique biodiversity.

The biodiversity of the island includes resident terrestrial bird species that occur year-round, and migratory bird species that come ashore seasonally to breed.

The Lord Howe Island Group is an excellent example of oceanic islands of volcanic origin supporting a unique ecological assemblage of plants and animals. It provides important breeding grounds for colonies of seabirds as well as providing vital natural habitat for the conservation of threatened species. Examples of such include endemics such as the flightless Lord Howe Woodhen (*Hypotaenidia sylvestris*), once regarded as one of the rarest birds in the world, and the Lord Howe Island Phasmid (*Dryococelus australis*), the world's largest stick insect that was thought extinct until it was rediscovered on a nearby volcanic sea stack known as Balls Pyramid.

The island group provides habitat for extensive colonies of nesting seabirds, making them very important over a vast oceanic region. For example, the islands are the only major breeding locality for the Providence Petrel (*Pterodroma solandri*), and they include one of the world's greatest breeding occurrences of Red-tailed Tropicbird (*Phaethon rubricauda*).

Lord Howe Island has many endangered endemic species or subspecies of plants and animals, with fauna including vertebrates and invertebrates. Some of these species occur within the lowlands where the study area is located and so there is potential for impacts on such biota.

Lord Howe Island is comprised of volcanic peaks at the northern and southern ends, between which are gently undulating coastal lowlands. The coastal lowlands have experienced the greatest degree of development since the island was first settled, in 1834, and more recently since the construction of the airport in 1974. The western side of the island is enclosed by a shallow coastal lagoon, while the eastern side of the island has smaller lagoons and more frontage to deeper ocean waters.

The North and South Zones are located on the western side of the island in the coastal lowlands. They include some areas of old farmlands, some areas of plantations of Kentia Palms, and some remnant and regenerating native vegetation.

Within the North Zone there is existing marine infrastructure, including the existing jetty, cargo loading and offloading areas, associated buildings, exotic and native vegetation including mown grasslands, shrubs and trees. However, small sections of the sandy/rocky beach along the foreshore of the lagoon are also present. The soils are predominantly comprised of coral sands however, the areas in the most northerly portion of the study area (beyond the subject land) include a mixture of coral sands and calcarenite rock.

Within the South Zone there is the existing WMF, as well as areas of remnant native vegetation, managed grasslands and cleared land. Small sections of sandy beach form the western margin of this zone, along the foreshore of the lagoon. The soils within the South Zone are comprised of predominantly coral sands.

1.6. Information Sources

1.6.1. Databases

A number of databases were utilised during the preparation of this BDAR, including:

- NSW DCCEEW BioNet Atlas (2025a);

- NSW DCCEEW Threatened Biodiversity Data Collection (TBDC) (2025b);
- Commonwealth Department of Climate Change, Energy, the Environment and Water (Cwlth. DCCEEW) Species Profile and Threats Database (2025);
- Commonwealth DCCEEW Protected Matters Search Tool (PMST) (DCCEEW, 2025); and
- NSW Government Spatial Services databases.

1.6.2. Literature

Literature on the ecology of Lord Howe Island was reviewed, including data and reports published by the LHIB and other ecological studies. Key documents reviewed included:

- Department of Environment and Climate Change (NSW) 2007, *Lord Howe Island Biodiversity Management Plan*, Department of Environment and Climate Change (NSW), Sydney (DECC, 2007);
- Sheringham P., Richards P., Gilmour P., & Kemmerer E., 2016, *A Systematic Flora Survey, Floristic Classification and High-Resolution Vegetation Map of Lord Howe Island*. Lord Howe Island Board, Lord Howe Island, NSW (Sheringham et al., 2016); and
- Lord How Island Board 2016, *Lord Howe Island Weed Management Strategy 2016 – 2025*, Lord Howe Island Board, Lord Howe Island (LHIB, 2016).

1.6.3. Aerial Photography

The aerial imagery utilised in this BDAR is sourced from ELVIS and captured by McMullen Nolan Group Pty Ltd, dated 16, 17 and 18 June 2023. Additional aerial images available on SixMaps, Google Earth and NearMap were also consulted.

2. Legislation

This section describes legislative requirements for ecological assessments that are required to be addressed as part of the development approval process for the Project.

2.1. New South Wales Legislation

2.1.1. Environmental Planning and Assessment Act 1979

The EP&A Act is the overarching planning legislation in NSW that provides for the creation of planning instruments that guide land use. The EP&A Act also provides for the protection of the environment, including the protection and conservation of native animals and plants. This includes threatened species, populations and ecological communities, and their habitats of biodiversity values, as listed in the BC Act.

2.1.1.1. Division 5.2 of Part 5 of the EP&A Act

Division 5.2 in Part 5 of the EP&A Act provides for a planning assessment and determination regime for State Significant Infrastructure (SSI). A SSI is a development declared by a State Environmental Planning Policy or Regional Environmental Planning Policy to be a SSI, or development which the Minister for Planning has called in for determination. The Minister for Planning is the consent authority for SSI. Any SSI may also be declared to be CSSI if it is of a category that, in the opinion of the Minister, is essential for the State for economic, environmental or social reasons. As outlined in Section 1.1, the Proponent seeks development consent for the Project as CSSI under Division 5.2, subdivision 5.13.

As identified in ***Section 1.1***, SEARs were issued by the DPHI on 14 April 2025, with Supplementary SEARs issued on 8 August 2025.

2.1.2. NSW Biodiversity Conservation Act 2016

The BC Act is the key piece of legislation in NSW relating to the protection and management of biodiversity and threatened species. The purpose of the BC Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. The BC Act is supported by several regulations, including the *Biodiversity Conservation Regulation 2017* (BC Regulation).

A key component of the BC Act is the introduction of the BOS. The BOS is intended to simplify biodiversity assessment and improve biodiversity outcomes by creating consistent assessment requirements to measure the likely biodiversity loss of development proposals and gains in biodiversity value achieved at offset sites through active management. The BOS has several triggers for entry into the scheme for local development while SSD and SSI automatically enter the scheme unless a waiver is granted.

Projects that trigger entry into the BOS are assessed via the BAM established under Section 6.7 of the BC Act. The BAM is established for the purpose of assessing certain impacts on threatened species and TECs, and their habitats, and the impact on biodiversity values. The BAM is structured around three primary stages. These are:

- Stage 1 - establishes a single consistent approach to assessing the biodiversity values on land;
- Stage 2 - provides for an impact assessment on biodiversity values where the land is a development site, clearing site or land proposed for biodiversity certification; and

- Stage 3 - provides for the assessment of the management requirements at a proposed biodiversity stewardship site and the likely improvement in biodiversity values that are predicted to occur over time.

As the Project comprises a development site, only Stage 1 and Stage 2 of the BAM apply and are addressed in this BDAR.

As outlined in ***Section 1.3***, the BAM does not apply to biodiversity that is endemic to Lord Howe Island and therefore a number of sections within this BDAR cannot be prepared in accordance with the BAM. Where sections of this BDAR cannot be prepared, reference has been made to the FFA provided in **Appendix A**, which includes further assessment of the Project on biodiversity within the subject land.

2.1.3. NSW Biosecurity Act 2015

Biosecurity is a vital consideration for Lord Howe Island projects because the island biodiversity is extremely vulnerable to introduced biodiversity in the form of flora (weeds), fauna (pest animals) and pathogens. It has already been impacted by many such entities since the original colonisation by European settlers (some of which have been successfully eradicated).

The objects of the NSW *Biosecurity Act 2015* (Biosecurity Act) are as follows:

1. The primary object of the Biosecurity Act is to provide a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers.
2. The other objects of the Biosecurity Act are as follows:
    a. to promote biosecurity as a shared responsibility between government, industry and communities,
    b. to provide a framework for the timely and effective management of the following:
        i. pests, diseases, contaminants and other biosecurity matter that are economically significant for primary production industries,
        ii. threats to terrestrial and aquatic environments arising from pests, diseases, contaminants and other biosecurity matter,
        iii. public health and safety risks arising from contaminants, non-indigenous animals, bees, weeds and other biosecurity matter known to contribute to human health problems,
        iv. pests, diseases, contaminants and other biosecurity matter that may have an adverse effect on community activities and infrastructure,
    c. to provide a framework for risk-based decision-making in relation to biosecurity,
    d. to give effect to intergovernmental biosecurity agreements to which the State is a party,
    e. to provide the means by which biosecurity requirements in other jurisdictions can be met, so as to maintain market access for industry.

Biosecurity rules on Lord Howe Island are different to those for NSW and the Australian mainland. The LHIB along with assistance from the Department of Primary Industries and Regional Development (DPIRD) – Marine Parks and Agriculture and Biosecurity, as well as other government agencies, are responsible for the biosecurity on Lord Howe Island. The LHIB have implemented strict biosecurity measures to safe-guard Lord Howe Island from pathogens, weeds and introduced pest species. These biosecurity measures are outlined in the Lord Howe Island Biodiversity Management Plan (DECC, 2007). Current environmental Projects being implemented to maintain and protect the Island's World Heritage values include the African Big-headed Ant Eradication Project, pest animal control Projects, weed eradication Project and environmental education Projects (LHIB, 2025).

Several invasive pests have already been removed from the island including cats, goats, pigs, and more recently Black Rats (R*attus rattus*). Other invasive pest species that occur on the island such as the Mallard x Pacific Black Duck hybrids (*Anas superciliosa* x *Anas platyrhynchos),* Feral Pigeons (*Columba livia*), Common Starling (*Sturnus vulgaris*), Blackbird (*Turdus merula*) and Masked Owl (*Tyto novaehollandiae*). Control strategies are in place for these species as they can recolonise the island (LHIB, 2025). Biosecurity controls for the introduction of other pests such as the Cane Toad (*Bufo marinus*) are also in place and managed by the LHIB (DECC, 2007).

Invasive weeds are identified as one of the most serious threats to Lord Howe Island's biodiversity and World Heritage values. Under the Biosecurity Act all weeds are required to be controlled by all persons under a "General Biosecurity Duty". The General Biosecurity Duty means that all public and private landowners or managers and all other people who deal with weed species (biosecurity matters) must use the most appropriate approach to prevent, eliminate, or minimise the negative impact (biosecurity risk) of those weeds (DPI, 2017). Under Division 2 of the Biosecurity Act, the LHIB is the local control authority for land within Lord Howe Island. The LHIB have specific statutory obligations for the management of weeds on Lord Howe Island and in 2016 published the *Lord Howe Island Weed Management Strategy 2016-2025* (LHIB, 2016). The Strategy provides a strategic framework for the continued reduction and elimination of the threats posed by invasive weeds from 2016 to 2026.

Highly infectious plant pathogens such as Myrtle Rust (*Austropuccinia psidii*) and Phytophthora (*Phytophthora cinnamomi*) have the potential to cause irrevocable damage to the environment. The LHIB is responsible for the control and management of infectious plant pathogens and have implemented monitoring and hygiene protocols across the island, such as the installation of footwear sanitary stations at all walking track heads (LHIB, 2025).

2.1.4. Water Management Act

Under the *Water Management Act 2000* (WM Act), waterfront land includes the bed and bank of any river, lake or estuary and all land within 40 metres of the highest bank of the river, lake or estuary. The National Resources Access Regulator (NRAR) administers the WM Act and is required to assess the impact of any proposed activity to ensure that no more than minimal harm will be done to waterfront land. A controlled activity approval is required to authorise the carrying out of a proposed activity. The WM Act also includes objects and principles aimed specifically at protecting and restoring ground water-dependent ecosystems.

2.1.4.1. Controlled Activities

Major projects (State Significant Development and SSI) are exempt from requiring approvals under the WM Act as water management considerations are included in the assessment of major projects and conditions of consent. This BDAR, therefore, does not include any assessments in relation to controlled activities under the WM Act.

2.2. Commonwealth Legislation

2.2.1. Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas of national significance. It also provides a mechanism for national environment protection and biodiversity conservation.

The EPBC Act is administered by the Commonwealth DCCEEW and provides protection for listed Matters of National Environmental Significance (MNES) including:

- Listed species and communities (e.g. listed threatened species and ecological communities and migratory species);
- Protected areas (e.g. World Heritage properties, Ramsar wetlands of international significance, conservation zones); and
- National, Commonwealth and Indigenous Heritage.

Under the EPBC Act, any action (which includes a development, project or activity) that is considered likely to have a significant impact on MNES must be referred to the Commonwealth Minister for DCCEEW.

A Referral (2025/10188) was submitted to Commonwealth DCCEEW on 7 May 2025. The Referral decision (dated 7 July 2025), determined the Project to be a controlled action for potential impacts to World Heritage properties (sections 12 and 15A), National Heritage places (sections 15B and 15C), listed threatened species and communities (section 18 & 18 A) and listed migratory species (section 20 & 20A).

As per the Referral decision, the Project is to be assessed via the assessment bilateral agreement with NSW. The Referral decision also provided a list of World Heritage properties, National Heritage Places, threatened species and migratory species which require assessment. These properties, places and species are addressed in **Chapter 5** and **Chapter 6** of this BDAR with additional assessments in **Chapter 8, Chapter 9** and **Appendix B**.

2.2.1.1. New South Wales Bilateral Agreement

In February 2015, a bilateral agreement was made under Section 45 of the EPBC Act between the Commonwealth of Australia and the State of NSW relating to environmental assessment. This bilateral agreement was amended (Amending Agreement No.1) effective 24 March 2020 to reflect changes to the EP&A Act, in particular the repeal of the *Threatened Species Conservation Act 1995* (TSC Act) and replacement with the BC Act. Under Amending Agreement No.1, the BAM and BOS, as introduced under the BC Act, are Accredited processes.

This BDAR identifies MNES entities, in particular those deemed to be potential candidates for controlled action (as detailed in the Referral decision). A summary of MNES entities assessed and relevant sections within this BDAR is provided in **Appendix B**.

2.2.2. International Treaty Obligations on Migratory Species

Australia is signatory to several agreements relating to migratory species. Migratory species listed under the following agreements and conventions are protected in Australia by being listed as MNES (Migratory Controlling Provision) under the EPBC Act:

- China–Australia Migratory Bird Agreement (CAMBA);
- Japan–Australia Migratory Bird Agreement (JAMBA);
- Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA); and
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

The CAMBA and JAMBA agreements list terrestrial, water and shorebird species which migrate between Australia and the respective countries. In both cases, the majority of listed species are shorebirds (DCCEEW, 2024).

Both agreements require the parties to protect migratory birds by:

- Limiting the circumstances under which migratory birds are taken or traded;
- Protecting and conserving important habitats;
- Exchanging information; and
- Building cooperative relationships.

The JAMBA agreement also includes provisions for cooperation on the conservation of threatened birds. Australian government and non-government representatives meet every two years with Japanese and Chinese counterparts to review progress in implementing the agreements and to explore new initiatives to conserve migratory birds (DCCEEW, 2024).

The ROKAMBA formalises Australia's relationship with the Republic of Korea in respect to migratory bird conservation and provides a basis for collaboration on the protection of migratory shorebirds and their habitat (DCCEEW, 2024).

In addition to these bilateral agreements, Australia is also a signatory of the Bonn Convention. This convention aims to conserve terrestrial, aquatic and avian migratory species throughout their range (CMS, 2025).

3. Methodology

3.1. Review of Existing Data

Existing information on biodiversity values within the assessment area (defined by the BAM as the subject land and a 1500 m buffer around it) was reviewed, which includes:

- Species data that is held in the NSW BioNet Atlas (DCCEEW (NSW), 2025a);
- NSW TBDC (DCCEEW (NSW), 2025b);
- Threatened and migratory species known to occur on Lord Howe Island as identified within the Lord Howe Island BMP (DECC, 2007); and
- Vegetation communities known to occur on Lord Howe Island as identified in the 2016 vegetation study (Sheringham et al., 2016).

This existing information was considered and included, where appropriate, into survey design, vegetation mapping and reporting.

3.2. Landscape Features

Landscape features requiring consideration were initially determined via desktop assessment. The desktop assessment included searches of available aerial imagery and topographic contour data available from SixMaps. The field surveys undertaken in July and December 2024, and January and February 2025, sought to verify the occurrence of the following landscape features:

- Rivers, streams and estuaries;
- Important and local wetlands;
- Karsts, caves, crevices, cliffs and areas of geological significance; and
- NSW BioNet Landscapes.

No amendments were required to be made to any of these landscape features following field surveys.

3.3. Additional Assessment Required by the Referral Decision

The assessment requirements from Commonwealth DCCEEW following a decision of 'Controlled action' for the Project require the proposed action to be assessed in accordance with the BAM under the bilateral assessment agreement, Amending Agreement No. 1. The Project assessment notes issued with the Referral decision specifies a list of MNES including World Heritage Places, National Heritage Places, threatened species and migratory species which require assessment. These include:

- World Heritage Properties and National Heritage Places likely to be significantly impacted:
    - Lord Howe Island Group
- Threatened species likely to be significantly impacted:

- Lord Howe Flax Snail (*Placostylus bivaricosus*) – Endangered; and
- Lord Howe Woodhen (*Hypotaenidia sylvestris*) – Endangered.

- Migratory species likely to be significantly impacted:
  - Wedge-tailed Shearwater (*Ardenna pacifica*).
- Threatened species which are possibly at risk of being impacted:
  - Lord Howe Island Pied Currawong (*Strepera graculina crissalis*) – Vulnerable;
  - Lord Howe Island Gecko (*Strepera graculina crissalis*) – Vulnerable;
  - Lord Howe Island Skink (*Oligosoma lichenigerum*) – Vulnerable;
  - Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit (*Limosa lapponica baueri*) – Endangered;

It is noted that additional marine species are also listed within the Project assessment notes which are assessed in the Coastal and Marine Ecological Assessment (O2 Marine, 2025). The MNES listed above are addressed in **Chapter 6** of this BDAR, and within with additional assessments in **Chapter 9, Appendix A** and **Appendix B**.

3.4. Native Vegetation Survey

3.4.1. Vegetation Mapping

The vegetation within subject land was ground-truthed by a botanist and ecologist from Cumberland Ecology within the South Zone between 8-12 July 2024 and within the North Zone between the 8-10 December 2024. Vegetation mapping was undertaken to examine and verify the mapping of the condition and extent of the different vegetation communities by conducting random meander searches, noting key characteristics of areas in similar broad condition states such as similar tree cover, shrub cover, ground cover, weediness or combinations of these. Soils were also inspected.

Where vegetation community boundaries were found to differ from the 2016 vegetation mapping (Sheringham et al., 2016), records were made of proposed new boundaries using a hand-held Global Positioning System (GPS) and mark-up of aerial photographs. The resultant information was synthesised using Geographic Information Systems (GIS) to create a spatial database that was used to interpret and interpolate the data to produce a vegetation map of the subject land.

In mainland NSW, vegetation communities are all typed and mapped as PCTs. For each such PCT, baseline information is stored and retrievable to inform environmental impact assessments, particularly those under the BC Act. Hower, on Lord Howe Island, no PCT classifications have been created by the State. Therefore the vegetation communities identified within the 2016 floristic study (Sheringham et al. 2016) have not currently been incorporated into the NSW Vegetation Classification System and subsequently have not been assigned to plant community types.

3.4.2. Vegetation Integrity Assessment

Vegetation integrity assessments were undertaken for PCTs in accordance with the BAM. Although the BAM cannot be formally applied to assess biodiversity values on Lord Howe Island because PCTs are not yet created there, the methods used for BAM plots align with the plot surveys undertaken in the 2016 floristic study (Sheringham et al., 2016) which used 20 x 20m plots and therefore the data was suitable for verifying the vegetation communities identified.

Sixteen BAM plots, including five plots within the North Zone and eleven plots within the South Zone, were undertaken within the study area and immediately adjacent areas in accordance with the BAM. The locations of BAM plots are shown in Figure 5 and Figure 6.

The BAM plot sampling included the establishment of a 20 x 50 m plot, within which the following data was collected:

- Composition for each growth form group by counting the number of native plant species recorded for each growth form group within the 20 m x 20 m floristic plot;
- Structure of each growth form group as the sum of all the individual projected foliage cover estimates of all native plant species recorded within each growth form group within the 20 m x 20 m floristic plot;
- Cover of 'High Threat Exotic' weed species within the 20 m x 20 m floristic plot;
- Assessment of function attributes within the 20 m x 50 m plot, including:
    - Count of number of large trees;
    - Tree stem size classes, measured as 'diameter at breast height over bark' (DBH);
    - Regeneration based on the presence of living trees with stems <5 cm DBH;
    - The total length in metres of fallen logs over 10 cm in diameter;
- Assessment of litter cover within five 1 m x 1 m plots evenly spread within each 20 m x 50 m plot; and
- Number of trees with hollows that are visible from the ground within each 20 m x 50 m plot.

As outlined above, the identification of PCTs and subsequent assessment of BAM plot data using the BAM-C could not be completed to calculate vegetation integrity scores. Nevertheless, Table 2 below provides the number of BAM plots undertaken within each of the vegetation communities identified within the study area and subject land. The location of plots has sought to capture the environmental variation of the vegetation communities identified within the study area. It is noted that where vegetation communities were not large enough to survey using BAM plots, rapid data points were taken to record the species composition.

Table 2 BAM plot survey details

Vegetation Zone	Vegetation Community #	Vegetation Community Name	Study Area (ha)	Subject Land (ha)	No. of Plots Completed
1	1	Coastal Spinifex - Dune Bean - Club Rush - Melanthera biflora - Saltwater Couch beach strandline grassland	1.31	0.26	2
2	2	Melanthera biflora - Saltwater Couch herbland/grassland on coral boulder beaches and rocky headlands	0.23	0.01	-
3	6	Sallywood swamp forest of poorly drained, low-lying areas	0.03	-	-
4	8	Bully Bush - Hopwood shrubland on shallow rocky soils	0.82	0.10	1
5	12a	Kentia Palm Forest on coral sand and calcarenite	1.20	0.18	2
6	12b	Banyan - Kentia Palm forest on coral sand and calcarenite	0.14	-	1
7	12a/Ex	Kentia Palm Forest on coral sand and calcarenite with emergent *Araucaria heterophylla*	0.26	0.02	1
8	17a	Greybark - Blackbutt rainforest	1.80	0.13	2
9	17b	Greybark - Blackbutt low closed forest on exposed basalt slopes	0.01	-	-
10	21	River Mangrove tall shrubland of brackish creeks	0.06	-	-
-	Ep	Environmental plantings	0.43	0.002	-
-	Np	Plantation	0.39	0.05	2
-	Ex	Exotic Vegetation	7.11	1.81	5

3.5. Threatened Flora Species Survey

This section provides details of the threatened flora species surveys that have been undertaken in the subject land.

3.5.1. Habitat Constraints and Geographic Limitations

As the BAM cannot be applied to biodiversity endemic to Lord Howe Island and as such ecosystem and species credit species cannot be identified using the BAM-C, no candidate (ecosystem) or predicted (species) species credit flora species were identified for this assessment. Instead, a list of potentially occurring threatened flora species was determined using the NSW BioNet Atlas and Commonwealth PMST. As outlined in the FFA provided in **Appendix A**, a likelihood of occurrence assessment was undertaken to determine the likelihood of threatened flora occurring within the subject land. Where a species could be excluded due to an absence of records, or following field surveys, it was determined that the habitat was degraded, or there was an absence of species-specific habitat requirements, then the species was identified as having a low likelihood of occurrence and subsequently excluded from further assessment.

3.5.2. Targeted Threatened Species Survey

Targeted threatened flora surveys were undertaken within the subject land and wider study area for flora species listed under the BC Act and/or EPBC Act that were previously recorded within the locality (5 km radius) of the study area and/or determined to have potential to occur based on the mapped vegetation communities. Although surveys were primarily focused on two species, Knicker Nut (*Caesalpinia bonduc*) and Sand Spurge (*Euphorbia psammogeton*) which were considered to have a moderate likelihood of occurrence, all threatened flora species previously recorded within the locality were considered during targeted threatened flora surveys given the small number of species overall. Details of the survey methods and a summary of the survey effort conducted for threatened flora species within the subject land and wider study area are provided belowError! Not a valid bookmark self-reference.. The location of flora surveys within the North and South Zones are shown in Figure 5 and Figure 6, respectively.

3.5.2.1. Random Meander

Target Species: As listed in **Table 3**.

Targeted threatened flora searches using random meanders was incorporated into the vegetation mapping and plot surveys during the July and December 2024 surveys.

3.5.2.2. Parallel Traverses

Target Species: As listed in **Table 3**.

Targeted surveys were conducted using parallel field traverses in combination with the random meander in accordance with the NSW Guide to Surveying Threatened Plants (NSW Government, 2020b). Targeted threatened flora surveys using parallel traverses were undertaken within the South Zone in July 2024 and the North Zone in December 2024.

Table 3 Threatened flora survey dates and methods

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period	Dates of Survey	Survey Method
Anthosachne kingiana subsp. *kingiana*	Phillip Island Wheat Grass	CE	CE	Jan – Dec	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Caesalpinia bonduc	Knicker Nut	E	-	Jan – Dec	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Calystegia affinis	Lord Howe Island Morning Glory	CE	CE	Jan – Dec	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Carmichaelia exsul	Lord Howe Island Broom	CE	-	Jan – Dec	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Chamaesyce psammogeton	Sand Spurge	E	-	Jan – Dec	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Coprosma inopinata	Small-leaved Currant Bush	E	-	Jan – Dec	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Geniostoma huttonii	Hutton's Geniostoma	E	E	Jan – Dec	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Hypolepis elegans	(blank)	CE	-	Jan – Dec	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Lepidorrhachis mooreana	Little Mountain Palm	CE	CE	Jan – Dec	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Polystichum moorei	Rock Shield Fern	E	E	Jan – Dec	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period	Dates of Survey	Survey Method
Xylosma parvifolia	Mountain Xylosma	E	E	Jan – Dec	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses

3.6. Threatened Fauna Species Survey

3.6.1. Habitat Constraints and Geographic Limitations

As the BAM cannot be applied to biodiversity endemic to Lord Howe Island and as such ecosystem and species credit species cannot be identified using the BAM-C, no candidate (ecosystem) or predicted (species) species credit fauna species were identified for this assessment. Instead, a list of potentially occurring threatened and migratory fauna species was determined using the NSW BioNet Atlas and Commonwealth PMST. As outlined in the FFA provided in **Appendix A**, a likelihood of occurrence assessment was undertaken to determine the likelihood of threatened and migratory fauna occurring within the subject land. Where a species could be excluded due to an absence of records, or following field surveys, it was determined that the habitat was degraded, or there was an absence of species-specific habitat requirements, then the species was identified as having a low likelihood of occurrence and subsequently excluded from further assessment.

3.6.2. Habitat Assessment

A fauna habitat assessment was conducted by an ecologist within the South Zone between the 8-12 July 2024 and within the North Zone between the 9-15 December 2024. The nature and extent of fauna habitats in the subject land and wider study area were assessed and areas where fauna species could reside or forage were identified. Habitat features including but not limited to hollow-bearing trees, nests, logs and woody debris, and artificial structures throughout the study area were recorded.

During this habitat assessment any fauna seen, heard or otherwise determined to be present from signs of fauna use were recorded.

3.6.3. Targeted Threatened and Migratory Species Survey

Targeted threatened and migratory fauna surveys were undertaken within the study area for fauna species listed under the BC Act and EPBC Act that were previously recorded within the locality of the study area and/or determined to have potential to occur based on the available habitat. A full list of potentially occurring threatened and migratory fauna species is provided within the FFA in **Appendix A**.

The details of each of the targeted threatened and migratory fauna surveys is provided below while a summary of the survey effort conducted for the threatened and migratory fauna species within the subject land is provided in **Table 4**. The location of targeted threatened fauna surveys is shown in Figure 7.

The recommended survey periods for threatened species listed under the BC Act are listed in the TBDC, while the recommended survey periods for threatened and/or migratory species listed under the EPBC Act are published under several different sources, including, but not limited to:

- Commonwealth DCCEEW Species Profile and Threats Database DCCEEW (Cwlth) (2025);
- Conservation Advice published by the Threatened Species Scientific Committee;
- Threatened Biodiversity Survey and Assessment Guidelines for Development and Activities (Working Draft) (DEC (NSW), 2004);

- Survey guidelines for Australia's threatened birds (DEWHA, 2010);
- Survey guidelines for Australia's threatened reptiles (DotE, 2011);
- Handbook of Australian, New Zealand & Antarctic Birds (HANZAB) Online (Higgins & Peter, 2002); and
- Lord Howe Island Biodiversity Management Plan (Appendix 5) (DECC, 2007).

The survey effort for migratory shorebirds is identified within the *Industry Guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebirds* published by the former Commonwealth Department of the Environment and Energy (DoEE, 2017). These guidelines state that the survey effort for migratory shorebirds is ideally comprised of four replicate surveys conducted during months when the majority of migratory shorebirds are present in the area, in most cases involving one survey in December, two surveys in January and one survey in February.

Table 4 Threatened and migratory fauna survey dates and methods

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period[1]	Dates of Survey	Survey Method
Birds						
Actitis hypoleucos	Common Sandpiper	-	M	Aug – Feb	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Anous stolidus	Common Noddy	-	M	Sep – May	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Ardenna carneipes	Flesh-footed Shearwater	V	M	Sep – May	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Ardenna pacifica	Wedge-tailed Shearwater	-	M	Sep – May	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Arenaria interpres	Ruddy Turnstone	V	V, M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Calidris acuminata	Sharp-tailed Sandpiper	-	V, M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period[1]	Dates of Survey	Survey Method
Calidris canutus	Red Knot	-	V, M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Calidris ferruginea	Curlew Sandpiper	E	CE, M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Calidris melanotos	Pectoral Sandpiper	-	M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Calidris ruficollis	Red-necked Stint	-	M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Charadrius bicinctus	Double-banded Plover	-	M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Charadrius veredus	Oriental Plover	-	M	Sep – May	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Chlidonias leucopterus	White-winged Black Tern	-	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period[1]	Dates of Survey	Survey Method
Fregetta grallaria	White-bellied Storm-Petrel	V	V	Sep – Feb	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Gallinago hardwickii	Latham's Snipe	-	M	Oct – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Gygis alba	White Tern	V	-	Sep – May	8-12 July 2024, 11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Hydroprogne caspia	Caspian Tern	-	M	Jan – Dec	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Hypotaenidia sylvestris	Lord Howe Woodhen	E	E	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Limosa lapponica baueri	Bar-tailed Godwit	E	E, M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Numenius madagascariensis	Eastern Curlew	-	CE, M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period[1]	Dates of Survey	Survey Method
Numenius minutus	Little Curlew	-	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Numenius phaeopus	Whimbrel	-	M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Onychoprion fuscata	Sooty Tern	V	-	Aug – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Pachycephala pectoralis contempta	Golden Whistler (Lord Howe Is. subsp.)	V	-	Jan – Dec	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Pluvialis fulva	Pacific Golden Plover	-	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Pterodroma nigripennis	Black-winged Petrel	V	-	Oct – May	8-12 July 2024, 11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Strepera graculina crissalis	Pied Currawong (Lord Howe Is. subsp.)	V	V	Jan – Dec	8-12 July 2024, 11-16 December 2024, 14-17 January 2025,	Bird Surveys (Area and Point surveys), opportunistic sightings

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period[1]	Dates of Survey	Survey Method
					15-18 February 2025	
Sula dactylatra	Masked Booby	V	M	Jan – Dec	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Tringa brevipes	Grey-tailed Tattler	-	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Tringa incana	Wandering Tattler	-	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Tringa nebularia	Common Greenshank	-	M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Tringa stagnatilis	Marsh Sandpiper	-	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Xenus cinereus	Terek Sandpiper	V	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Zosterops lateralis tephropleurus	Silvereye (Lord Howe Is. subsp.)	V	-	Jan – Dec	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period[1]	Dates of Survey	Survey Method
Reptiles						
Christinus guentheri	Lord Howe Island Gecko	V	V	Nov – Feb	11-16 December 2024	Funnel trapping, spotlighting
Oligosoma lichenigera	Lord Howe Island Skink	V	V	Nov – Feb	11-16 December 2024	Pitfall trapping, funnel trapping, diurnal active searches
Snails						
Placostylus bivaricosus	Lord Howe Placostylus	E	E	Jan – Dec	9-11 July 2024, 11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Spotlighting

[1] *Recommended survey periods have been determined based on a review of the TBDC as well as other Commonwealth guidelines.*

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

3.6.3.1. Bird Surveys – Area Searches

Target Species: All birds listed in Table 3 *above.*

Area searches were undertaken across four sites within the study area, including two sites within the North Zone and two sites within the South Zone. Area searches were undertaken by a team of two ecologists for a 20 min period at each site, sampling approximately 1 ha. Each site was searched systematically, while stopping or moving to investigate sightings and/or calls. Area searches were undertaken across four survey periods between 8-12 July 2024, 11-16 December 2024, 14-17 January 2025 and 15-18 February 2025.

Area searches were predominantly undertaken within habitats that were comprised of denser vegetation, allowing observers more flexibility and movement to explore signs of presence and thoroughly search each site. These were supplemented by point surveys as described in ***Section 3.6.3.2***.

3.6.3.2. Bird Surveys – Point Survey

Target Species: All birds listed in Table 3 *above.*

Point surveys were undertaken across four sites within the study area, including two sites within the North Zone and two sites within the South Zone. Sites selected for point surveys were located along the foreshore, where observers had clear vantage points of birds present within each site. Point surveys were undertaken by a team of two ecologists for a 20 min period at each site over a minimum of four consecutive days. Point surveys were undertaken over three survey periods between 11-16 December 2024, 14-17 January 2025 and 15-18 February 2025.

3.6.3.3. Migratory Shorebird Surveys

Target Species: Bar-tailed Godwit, Black-tailed Godwit, Common Greenshank, Common Sandpiper, Curlew Sandpiper, Eastern Curlew, Greater Sand Plover, Latham's Sipe, Little Curlew, Marsh Sandpiper, Pacific Golden Plover, Pectoral Sandpiper, Red Knot, Red-necked Stint, Ruddy Turnstone, Sharp-tailed Sandpiper, Terek Sandpiper, Whimbrel.

Migratory shorebird surveys were undertaken using a combination of area searches and point surveys as per the methods described above. Migratory shorebird surveys were undertaken with reference to the '*Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species' (DoEE, 2017).* Surveys were undertaken across three survey periods, one from 11-16 December 2024, one from 14-17 January 2025 and one from 15-18 February 2025, which were during the months when shorebirds are considered most likely to be present within the study area. A fourth survey was not considered to be warranted given the results of the three surveys undertaken, as well as the condition of habitat within the study area and consultation with the Ranger from the LHIB who indicated that it was unlikely that additional species would rely on the habitat within the study area beyond those already identified.

Surveys were undertaken during both high and low tides to survey for both roosting and foraging shorebirds and were repeated over a minimum of four days during each survey period. During surveys the following was recorded:

- Date, time of day;

- Tide height;
- General weather conditions;
- Observer names;
- Habitat description;
- Species present;
- Species abundance; and
- Species behaviour (i.e. roosting/foraging).

3.6.3.4. Pitfall Traps

Target Species: Lord Howe Island Skink.

Pitfall traps were established within the study area in areas comprised of dense litter which offer suitable foraging and shelter habitat. Furthermore, one site within the North Zone as well as one representative site beyond the study area were surveyed given the presence of calcarenite rock, also known to be favoured by the species for shelter. Pitfall traps were set for five nights in December 2024. Six trap lines were established along transects, comprising six 10 litre buckets dug into the ground and 20 m of drift fencing set between each bucket along the trap line. Leaf litter and small twigs were placed in the bottom of each bucket to provide shelter for trapped animals. Traps were checked each morning within two hours of sunrise and again each afternoon within two hours of sunset.

Of the six trap lines established, two were located within the North Zone, three within the South Zone and one was located within a reference site within Steven's Reserve that comprised similar habitat to that within the North and South Zones.

3.6.3.5. Funnel Traps

Target Species: Lord Howe Island Skink, Lord Howe Island Gecko.

Funnel trapping was undertaken in conjunction with pitfall trapping. At each transect four funnel traps were evenly distributed along the drift fencing (two on either side of the drift fence) at approximately 4-5m intervals. Funnel traps were set in shaded areas where possible, however additional cover using fronds and litter were placed over the funnel traps to provide shading as required. Funnel traps were set for five nights and checked each morning within 2 hours of sunrise and again each afternoon within two hours of sunset. Any fauna captured was identified and released.

3.6.3.6. Diurnal Active Searches

Target Species: Lord Howe Island Skink.

Diurnal active searches were undertaken opportunistically within the study area from 11-16 December 2024, 14-17 January 2025 and 15-18 February 2025. Diurnal active searches predominantly involved searches under boats and canoes that had been left along the grassy banks within the study area. Where possible, rocks were

also turned over to search for the species, along with other material that had been left/dumped such as pieces of wood. When turning rocks, care was taken when replacing turned items to maintain the seal between the item and ground.

3.6.3.7. Spotlighting

Target Species: Lord Howe Island Gecko, Lord Howe Island Skink, Lord Howe Placostylus

Spotlighting was undertaken via a random meander throughout the study area using high powered hand-held torches, focusing on the potential for presence of the target species. Searches for the Lord Howe Island Skink and Lord Howe Island Gecko involved searches of cavities within calcarenite rock and tree trunks, while searches for the Lord Howe Placostylus involved searches for live snails on the ground amongst the leaf litter. Where possible, searches for the Lord Howe Island Placostylus were undertaken during rainfall events and in the days post rainfall. Spotlighting searches were undertaken across the study area for approximately four hours each night by two ecologists. A total of 11 nights of survey were undertaken, including two nights in July 2024, five nights in December 2024, two nights in January 2025 and two nights in February 2025. It is noted that the spotlighting surveys undertaken within the July 2024, and the January and February 2025 survey periods, were undertaken opportunistically following rainfall events which increased the probability of detecting the Lord Howe Placostylus.

Additional spotlighting surveys were undertaken during the December 2024 survey period in accessible areas outside of the study area that comprised similar habitat to the study area. Sites comprising similar vegetation communities around local community areas were identified during the desktop assessment and subject to surveys. Sites were surveyed for a minimum of two nights, unless they were deemed to be unsuitable based on an assessment of habitat during surveys. These additional surveys were undertaken to assess the occurrence of the target species on a broader landscape scale.

3.7. Weather Conditions

Surveys were undertaken in July and December 2024 and January and February 2025. Weather conditions during surveys were considered suitable for the detection of target species. A monthly summary of weather conditions in the wider locality of the study area (Bureau of Meteorology Weather Station 200839 – Lord Howe Island, NSW) leading up to and during the field surveys is provided in Table 5 (Bureau of Meteorology, 2025).

Table 5 Weather conditions during field surveys

Date	Temperature Minimum (°C)	Temperature Maximum (°C)	Rainfall (mm)
Proceeding Months*			
April 2024	18.4	24.2	254.4
May 2024	16.1	21.6	104.4
June 2024	15.1	21.0	166.0
September 2024	15.6	21.3	116.7
October 2024	15.8	21.5	134.6
November 2024	18.9	23.7	188.4

Date	Temperature Minimum (°C)	Temperature Maximum (°C)	Rainfall (mm)
During Surveys			
July 2024			
08/07/2024	14.9	19.5	6.4
09/07/2024	16.1	20.3	0.2
10/07/2024	18.6	20.9	0.0
11/07/2024	17.3	20.1	9.8
12/07/2024	16.9	20.5	17.2
13/07/2024	17.0	21.4	53.6
December 2024			
11/12/2024	20.2	25.5	25.2
12/12/2024	16.5	24.9	0.0
13/12/2024	19.3	26.0	0.0
14/12/2024	22.3	26.0	5.6
15/12/2024	22.5	26.3	0.0
16/12/2024	23.2	26.2	0.6
January 2025			
14/01/2025	20.2	26.2	1.2
15/01/2025	21.2	26.2	1.6
16/01/2025	22.5	26.9	0.0
17/01/2025	21.9	26.7	0.6
February 2025			
15/02/2025	20.8	26.2	7.4
16/02/2025	21.8	28.7	0.0
17/02/2025	21.2	24.9	9.0
18/02/2025	19.1	24.7	1.8

** For preceding months values, temperatures are provided as a mean value, and rainfall is provided as a total.*

3.8. Limitations

Vertebrate fauna and vascular flora of the locality are relatively well known based upon a sizeable database of past records. The surveys by SLR Consulting added to the existing database and helped to provide a clear indication of the likelihood that various species occur, or are likely to occur, within the subject land. The data obtained from database assessment and surveys of the study area furnished an appropriate level of information to support this assessment.

Given the restrictions on guests of Lord Howe Island, timing for field surveys was somewhat limited by flight and accommodation availabilities. Therefore, once surveys were scheduled, minor adjustments could not be made based on predicted or current weather events. Nevertheless, the weather conditions at the times of the

flora surveys were generally favourable for plant growth and production of features required for identification of most species. Shrubs, grasses, herbs and creepers were readily identifiable in most instances. It is expected that not all flora species present would have been recorded during surveys. Despite this, it is considered that sufficient information has been collected to assess issues including conservation significance of the flora, condition and viability of bushland and likely impact on native vegetation. An assessment of the likelihood of occurrence of threatened flora species recorded within the locality of the subject land in the database searches was undertaken to supplement the flora survey as outlined in the FFA provided in **Appendix A**.

Furthermore, the weather conditions at the time of the fauna surveys were generally favourable to detect target species. However, threatened snails such as the Lord Howe Placostylus, are typically more active during periods of wet weather. While some rainfall was received during targeted surveys, particularly in July 2024, this was relatively brief and limited to a single night or a couple of nights and not the entire survey period. Therefore, the chances of detecting threatened snails were higher during these periods and lower during dry conditions. Nevertheless, the surveys undertaken were considered suitable to determine the species occurrence within the study area.

Another limitation of the survey work is that the work took place within a 12-month period, and there is a possibility of different conditions between years. This has been addressed by making detailed use of previous survey results at other parts of the island.

It is also important to recognise that the island biota has been greatly impacted over the years by feral animals, particularly pigs, goats and black rats (*Rattus rattus*), which have all been removed from the island. In the case of black rats, an island-wide eradication commenced in 2019. Since July 2023, there has been no signs of rodents on Lord Howe Island and there are already signs of substantial recovery of many species of wildlife such as the Lord Howe Island Woodhen.

Historically, the lowlands of Lord Howe Island have suffered the greatest ecological impacts post human settlement and this is where the North and South Zones are located. The result is that much of the lowland habitat for many species has been fragmented and degraded. After the eradication of black rats, is it likely that ecological recovery is continuing. For this reason, the current surveys for threatened species provide a snapshot in what could be a continuum of recovery. In years to come, there may be greater numbers of various native plant and animal species as a result of the eradication program. For this reason, the FFA provided in **Appendix A** has taken a conservative approach to assessing the likelihood of occurrence for threatened and migratory species.

The FFA provided in **Appendix A** has focused on terrestrial species of animals (mainly vertebrates) and plants (mainly vascular plants) that are known to occur on Lord Howe Island. Amongst the invertebrates, only molluscs and one insect (Lord Howe Island Phasmid) are threatened. Notwithstanding that, there is potential for other invertebrate animals to occur and to be of conservation significance. Such potential species have been little-studied and have not been assessed by this investigation. Notwithstanding that, they have been accounted for on the assumption that such invertebrate fauna, if restricted to the island or rare, are likely to be associated with native vegetation. So, to a degree, consideration of native vegetation is assumed to provide a surrogate for consideration of invertebrate biodiversity.

4. Landscape Features

4.1. Assessment Area

The subject land is approximately 5.26 ha in area and is shown in Figure 2. As the Project is being assessed as a site-based project, the assessment area comprises the area of land within a 1,500 m buffer around the outer boundary of the subject land. The assessment area is approximately 1,614 ha in size and is shown in Figure 2**.**

4.2. Landscape Features

Landscape features identified within the subject land and assessment area are outlined below. The extent of these features within the subject land is shown in Figure 1 and the extent within the assessment area is shown in Figure 2.

4.2.1. IBRA Bioregions and IBRA Subregion

The subject land and assessment area occur within the Pacific Subtropical Islands Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion. The subject land and assessment area both occur entirely within the Lord Howe Island IBRA Subregion.

4.2.2. Rivers, Streams and Estuaries

There are no watercourses within the subject land, however the subject land does include a portion of the Lord Howe Island Lagoon, which is part of the Tasman Sea. There is one watercourse within the study area which is in close proximity to the subject land. This watercourse is known as Cobby's Creek and is a second order stream located within the southern portion of the South Zone.

Several other waterways occur within the wider assessment area ranging from first to third order streams (see Figure 2).

4.2.3. Important and Local Wetlands

No important wetlands listed in the Directory of Important Wetlands in Australia are present in the subject land and/or assessment area. No mapped areas of wetlands under the Coastal Management State Environmental Planning Policy are present in the subject land or assessment area.

4.2.4. Geology and Soils

The subject land and wider assessment area do not fall within the soil landscapes mapping for Central and Eastern NSW.

Lord Howe Island is thought to be the remnant of a large shield volcano, with the present land mass representing two periods of volcanic activity. The northern Hills (the Malabar Hill – Mount Eliza chain) and the central Hills (Transit Hill and Intermediate Hill) of Lord Howe Island are remnants of the earlier volcanics approximately 6.9 million years ago. The larger volcanic activity took place 6.3 million years ago, and produced the basalt flows which constitute the two southern mountains, Mount Gower and Mount Lidgbird (DECC, 2007).

The most common volcanic rocks found on the island are basalt and the associated breccia. Successive ice ages, causing a variation in sea level, led to deposits of wind-blown coral and shell debris on the low-lying, flat areas (DECC, 2007). Percolating rainwater cemented these into sedimentary rock known as aeolian calcarenite.

The Lord Howe occurrence of aeolian calcarenite is the most significant anywhere on the NSW coast (DECC, 2007). Some of the deposits have been dated to over 130,000 years old and contain fossils of bird bones and eggs, land and marine snails, and the now extinct Horned Turtle (*Meiolania platyceps*). As such, the soils on Lord Howe Island are largely derived from the basaltic lava flows and calcareous sediments.

Small swamps are a significant feature of lowland parts of the island and are a result of recent beach deposits which have built up across drainage lines on the island (DECC, 2007).

4.2.5. Habitat Connectivity

Within the South Zone, the vegetation within the subject land has been subject to fragmentation and isolation by the Lord Howe Island airport. The vegetation within the subject land is part of a larger patch of vegetation and the Project will require clearing of vegetation around the edges of previously cleared areas. The small area of connectivity between habitat is present along the top banks of the lagoon, which will be retained. While some areas of previously cleared land including exotic grassland and access tracks will be removed, patches of native vegetation will remain which will continue to provide connectivity to larger patches of native vegetation to the south.

Within the North Zone, vegetation and habitat has been previously fragmented. Patches of native vegetation occur along the top of the banks of the lagoon, however these are surrounded by cleared areas and mown grassland. Areas on the southern side of the existing jetty have connectivity to vegetation and habitat to the south, however this is fragmented by roads, human made structures and cleared areas. To the north of the existing jetty, small patches of shrubby vegetation provide habitat for native fauna, however these are relatively isolated by large, cleared areas including the public boat ramp. North of the public boat ramp, the subject land is located on the southern end of a much larger tract of native vegetation and associated habitat which extends around residential areas and into the northern mountains.

Given the Project requires clearing predominantly along the edges of previously cleared areas along the edges of the lagoon, and the habitat connectivity will not be reduced much beyond current conditions, it is unlikely that the Project will hinder the dispersal of native species. The majority of native fauna known to utilise the habitat within the subject land are highly mobile bird species capable of accessing habitat resources across the study area and wider island. Furthermore, additional areas will be revegetated within the subject land and wider study area which will continue to provide habitat connectivity across the landscape.

4.2.6. Karsts, Caves, Crevices, Cliffs and Areas of Geological Significance

No karsts, caves, crevices, cliffs or areas of geological significance have been identified within the subject land, however these features are all present within the assessment area, predominantly within the mountainous areas in the north between Malabar Hill and Mount Eliza, and in the south around Mount Gower and Mount Lidgbird. Additional cliff lines are present along the eastern side of the island between Ned's Beach and Blinky Beach.

4.2.7. Areas of Outstanding Biodiversity Value

Lord Howe Island has not been declared as an Area of Outstanding Biodiversity Value (AOBV). Currently only four areas of critical habitat have been declared as AOBVs including:

- Gould's Petrel habitat;
- Little Penguin population in Sydney's North Harbour;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve; and
- Wollemi Pine habitat.

4.2.8. BioNet NSW Landscapes

Lord Howe Island is not included on the BioNet NSW Landscapes and therefore this section is not applicable.

4.3. Native Vegetation Cover

Native vegetation cover is a component of the BAM used in conjunction with patch size to calculate habitat suitability for ecosystem and species credit species and therefore is not applicable to this assessment. Nevertheless, the native vegetation cover has been calculated through the use of GIS. To map native vegetation cover within the subject land and assessment area, this assessment utilised the detailed vegetation mapping prepared by Cumberland Ecology in conjunction with Sheringham et al. (2016) floristic study. The native vegetation cover within the assessment area is shown in **Figure 2**. The assessment area is approximately 1,614 ha in size, of which approximately 491 ha comprises native vegetation cover, which represents 30% of the assessment area. Therefore, the native vegetation cover value is assigned to the cover class of >30–70%.

5. Native Vegetation

5.1. Native Vegetation Extent

The subject land has been subject to detailed surveys by Cumberland Ecology for the purpose of this BDAR. The native vegetation extent within the subject land was determined through aerial photograph interpretation and field surveys. The native vegetation extent within the subject land is shown in **Figure 8**. It occupies approximately 491ha, which represents 30% of the subject land. The native vegetation extent within the subject land comprises a mix of remnant native vegetation, environmental plantings and native plantations.

The remaining areas within the subject land are comprised of exotic vegetation (predominantly mown grasslands), cleared areas, sandy beaches and water. In accordance with Section 5.1.1.5 of the BAM, these areas do not require further assessment, unless they provide habitat for species credit species.

No apparent visual differences between the aerial photographs used in this assessment and the native vegetation cover shown in Figure 8 have been identified.

5.2. Vegetation Communities

The BAM requires the identification of PCTs within the subject land. As previously stated, the vegetation on Lord Howe Island has not been assigned to PCTs, and as such, PCTs cannot be identified within the subject land. Therefore, the classification of vegetation communities has been undertaken in accordance with the community profiles identified in the 2016 floristic study (Sheringham et al., 2016).

Several areas within the study area have shown evidence of recent regeneration which has resulted in redefining the boundaries of the vegetation communities present. The ten native vegetation communities and their conditions within the subject land are summarised in **Table 6.**

The distribution of vegetation communities within the study area is provided in Figure 9 (North Zone) and Figure 10 (South Zone). Descriptions of the vegetation communities present within the study area including their formation and class in accordance with the 2016 floristic study (Sheringham et al., 2016) are documented in the FFA provided in **Appendix A** and replicated in the sections below. It is noted that one species, *Melanthera biflora* has been subject to a name change and is now known as *Wollastonia uniflora*. However, to maintain consistency with the vegetation descriptions provided in the 2016 floristic study, this report has referred to the species as *Melanthera biflora*.

Table 6 Vegetation communities and approximate areas within the subject land and study area

Community #	Vegetation Community	BC Act Status	EPBC Act Status	Study Area			Subject Land		
				North Zone	South Zone	Total	North Zone	South Zone	Total
Native Vegetation Communities									
1	Coastal Spinifex - Dune Bean - Club Rush - Melanthera biflora - Saltwater Couch beach strandline grassland	-	-	0.00	1.31	1.31	0.00	0.26	0.26
2	Melanthera biflora - Saltwater Couch herbland/grassland on coral boulder beaches and rocky headlands	-	-	0.23	0.00	0.23	0.01	0.00	0.01
6	Sallywood swamp forest of poorly drained, low-lying areas	CEEC	CEEC	0.00	0.03	0.03	0.00	0.00	0.00
8	Bully Bush - Hopwood shrubland on shallow rocky soils		-	0.18	0.64	0.82	0.04	0.06	0.10
12a	Kentia Palm Forest on coral sand and calcarenite		-	0.07	1.14	1.20	0.01	0.17	0.18
12b	Banyan - Kentia Palm forest on coral sand and calcarenite		-	0.14	0.00	0.14	0.00	0.00	0.00
12a/Ex	Kentia Palm Forest on coral sand and calcarenite with emergent *Araucaria heterophylla*		-	0.26	0.00	0.26	0.02	0.00	0.02
17a	Greybark - Blackbutt rainforest		-	0.00	1.80	1.80	0.00	0.13	0.13
17b	Greybark - Blackbutt low closed forest on exposed basalt slopes		-	0.00	0.01	0.01	0.00	0.00	0.00
21	River Mangrove tall shrubland of brackish creeks		-	0.00	0.06	0.06	0.00	0.00	0.00
Ep	Environmental plantings		-	0.00	0.43	0.43	0.00	0.002	0.00

Community #	Vegetation Community	BC Act Status	EPBC Act Status	Study Area			Subject Land		
				North Zone	South Zone	Total	North Zone	South Zone	Total
Np	Plantation			0.26	0.13	0.39	0.05	0.00	0.05
Subtotal				**1.13**	**5.55**	**6.68**	**0.14**	**0.61**	**0.75**
Other Vegetation Communities									
Ex	Exotic Vegetation		-	0.50	7.11	7.60	0.33	1.48	1.81
Beach	Sand/Boulder Beach			1.13	1.07	2.19	0.34	0.01	0.34
Cl	Cleared land		-	0.49	1.74	2.23	0.38	1.08	1.46
Water	Water			1.00	0.00	1.00	0.89	0.00	0.89
Subtotal				**3.11**	**9.91**	**13.02**	**1.94**	**2.57**	**4.51**
Total				**4.24**	**15.46**	**19.70**	**2.08**	**3.18**	**5.26**

CEEC = Critically Endangered Ecological Community

5.2.1. Coastal Spinifex - Dune Bean - Club Rush - Melanthera biflora - Saltwater Couch beach strandline grassland

Community #: 1

Scientific Name: *Spinifex sericeus – Vigna marina – Ficinia nodosa – Melanthera biflora – Sporobolus virginicus var. virginicus*

Vegetation Formation: Grasslands

Vegetation Class: Maritime Grasslands

Status: Not listed

This community is known to occur on unconsolidated calcareous beach dunes, such as those at North Bay, Old Settlement, Ned's, Blinky and Lagoon beaches (Sheringham et al. 2016). Within the study area this community is restricted to the South Zone, where it occurs as a low, dense grassland or sedgeland running parallel to Lagoon Beach. There are gradual transitions in weed abundance across the community. Common ground layer species are *Spinifex sericeus* (Hairy Spinifex), *Vigna marina* (Dune Bean), *Ficinia nodosa* (Knobby Club-rush), *Melanthera biflora*, *Sporobolus virginicus* (Sand Couch) and *Tylophora biglandulosa*. Scattered emergent shrubs of *Cassinia tenuifolia* (Bully Bush) are also present. Exotic species are dominant within more disturbed areas of the community and include the grasses *Stenotaphrum secundatum* (Buffalo Grass), *Cenchrus clandestinus* (Kikuyu), *Ehrharta erecta* (Panic Veldtgrass) and *Bromus catharticus* (Prairie Grass) as well as herbs *Euphorbia cyathophora* (Painted Spurge), *Euphorbia paralias* (Sea Spurge), *Hydrocotyle bonariensis* (Largeleaf Pennywort) and *Cakile edentula* (American Sea Rocket).

One threatened flora species, *Chamaesyce psammogeton* (Sand Purge), known to occur on Lord Howe Island is associated with this community however was not recorded within the study area.

Examples of the community within the study area are shown in Photograph 1 and Photograph 2.

Photograph 1 Coastal Spinifex – Dune Bean – Club Rush – Melanthera biflora – Saltwater Couch beach strandline grassland within the study area with low cover of introduced grasses

Photograph 2 Low condition Coastal Spinifex – Dune Bean – Club Rush – Melanthera biflora – Saltwater Couch beach strandline grassland within the study area with high cover of introduced grasses

5.2.2. *Melanthera biflora* - Saltwater Couch herbland/grassland on coral boulder beaches and rocky headlands

Community #: 2

Scientific Name: *Melanthera biflora – Sporobolus virginicus* var. *virginicus – Canavalia rosea*

Vegetation Formation: Grasslands

Vegetation Class: Maritime Grasslands

Status: Not listed

This community occurs on rocky calcarenite flats in near coastal areas exposed to the ocean, or occasionally on basalt slopes, mainly in the northern half of the island (Sheringham et al. 2016). Within the study area it is restricted to the North Zone where it occurs on steep calcarenite slopes and cliffs adjacent to the ocean. This community is dominated by the introduced grasses *Cenchrus clandestinus* (Kikuyu) and *Stenotaphrum secundatum* (Buffalo Grass). Native species present in the ground layer include *Melanthera biflora*, *Sporobolus virginicus* (Sand Couch), *Spinifex sericeus* (Hairy Spinifex) and *Ficinia nodosa* (Knobby Club-rush). Scattered emergent shrubs of *Cassinia tenuifolia* (Bully Bush), *Melaleuca howeana* (Tea Tree), and *Ochrosia elliptica* are also present. In addition to the dominant grasses, other exotic species present include *Ipomoea cairica* (Coastal Morning Glory), *Ehrharta erecta* (Panic Veldtgrass), *Bromus catharticus* (Prairie Grass), *Hydrocotyle bonariensis* (Largeleaf Pennywort) and *Cakile edentula* (American Sea Rocket).

An example of the community within the study area is shown in Photograph 3.

Photograph 3 Saltwater Couch herbland/grassland on coral boulder beaches and rocky headlands growing on calcarenite within the North Zone.

5.2.3. Sallywood swamp forest of poorly drained, low-lying areas

Community #: 6

Scientific Name: *Lagunaria patersonia subsp. patersonia / Aegiceras corniculata – Hibiscus tiliaceus – Myoporum insulare / Commelina cyanea*

Vegetation Formation: Forested Wetlands

Vegetation Class: Coastal Swamp Forests

Status: CEEC BC Act.

This community is restricted to a small estuarine area of moist alluvium along the banks of Cobbys Creek bordering sand dunes in the southern portion of the South Zone. This community has been mapped as a minor extension of the community previously mapped on Cobbys Creek to the east of Lagoon Road (Sheringham et al. 2016). It occurs on the creek bank adjacent to mangroves (Community 21) and to Kentia Palm Greybark Rainforest (Community 18) in adjacent areas.

Within the study area this community occurs as a closed forest. The dominant trees include *Lagunaria patersonia* (Norfolk Island Hibiscus) with occasional *Hibiscus tiliaceus* (Cottonwood Hibiscus) and *Ficus macrophylla* subsp. *columnaris* (Banyan). A sparse mid-layer of *Aegiceras corniculatum* (River Mangrove) and

Myoporum insulare (Common Boobialla) is present. The ground layer is sparse and comprises *Commelina cyanea* (Blue Wandering Jew) and *Oplismenus imbecillis*.

An example of the community within the study area is shown in Photograph 4**.**

Photograph 4 Sallywood swamp forest within the study area

5.2.4. Bully Bush – Hopwood shrubland on shallow rocky soils

Community #: 8

Scientific Name: *Lagunaria patersonia subsp. patersonia – Drypetes deplanchei / Cassinia tenuifolia – Dodonaea viscosa subsp. burmanniana – Melaleuca howeana / Muehlenbeckia complexa / Ficinia nodosa – Sporobolus virginicus var. virginicus – Poa poiformis*

Vegetation Formation: Heathlands

Vegetation Class: Coastal Headland Heaths

Status: Not listed

On Lord Howe Island, this community is typically located on steep slopes below cliffs, rocky ridges and regenerating landslips with shallow soils derived from basalt and breccia.

Within the study area this community occurs as a low-mid closed shrubland with a sparse, emergent upper layer of *Drypetes deplanchei* (Greybark), *Lagunaria patersonia* subsp. *patersonia* (Sallywood), *Hibiscus tiliaceus* (Cottonwood Hibiscus) and *Cryptocarya triplinervis var. triplinervis* (Blackbutt) with the occasional *Howea*

forsteriana (Kentia Palm). It occurs on coastal sand dunes in exposed areas adjacent to Community 1 (in the South Zone) or on exposed calcarenite adjacent to Community 2 (in the North Zone) where it occurs in a narrow strip. In the South Zone there is an open to dense shrub layer dominated by *Cassinia tenuifolia* (Bully Bush), *Dodonaea viscosa* subsp. *burmanniana* (Hopwood) and *Melaleuca howeana* (Tea Tree). Other scattered shrubs within the community include *Alyxia ruscifolia* (Prickly Alyxia), *Leucopogon parviflorus* (Coastal Beard-heath) and *Ochrosia elliptica* (Red Berrywood). The vine *Jasminum didymum* subsp. *didymum* is also present scrambling through shrubs. Within the ground layer, the dominant species include *Vigna marina* (Dune Bean), *Ficinia nodosa* (Knobby Club-rush), *Euchiton involucratus* (Star Cudweed) and *Melanthera biflora*.

In the North Zone, Community 8 forms an open to dense shrub layer dominated by *Cassinia tenuifolia* (Bully Bush) and *Melaleuca howeana* (Tea Tree) and in places *Atriplex cinerea* (Grey Saltbush). Scattered emergents of *Howea forsteriana* (Kentia Palm), *Lagunaria patersonia* subsp. *patersonia* (Sallywood), *Cryptocarya triplinervis var. triplinervis* (Blackbutt) and *Ficus macrophylla* ssp. *columnaris* are present. Vines are present, climbing over the shrubs and include *Stephania japonica*, *Jasminum didymum* subsp. *didymium, Tylophora biglandulosa*, and the introduced *Ipomoea cairica* (Coastal Morning Glory).

There is some variation in shrub density, with sparser shrubland located in more exposed areas where gaps between shrubs are dominated by ground layer species of Community 1 and 2 in transitional areas. In more protected areas dense shrubs are dominant. Areas with a more open shrubland also comprise a higher density of exotic species compared to other areas of the community.

Several exotic ground layer species are also present within Community 8, including *Stenotaphrum secundatum* (Buffalo Grass), *Cenchrus clandestinus* (Kikuyu), *Ehrharta erecta* (Panic Veldtgrass), *Conyza parva* (Fleabane), *Solanum nigrum* (Black-berry Nightshade), *Hypochoeris radicata* (Cat's Ear) *Sonchus oleraceus* (Common Sowthistle) and *Hydrocotyle bonariensis* (Large-leaved Pennywort).

Examples of the community within the study area are shown in Photograph 5, Photograph 6 and Photograph 7.

Photograph 5 Open shrubland of Bully Bush – Hopwood shrubland (South Zone)

Photograph 6 Dense shrubland of Bully Bush – Hopwood shrubland (South Zone)

Photograph 7 Bully Bush – Hopwood shrubland forming a narrow strip within the North Zone)

5.2.5. Kentia Palm – Banyan forest on sand or calcarenite of coastal lowlands

Community #: 12a, 12b

Scientific Name: *Ficus macrophylla subsp. columnaris / Howea forsteriana / Asplenium milnei*

Vegetation Formation: Rainforests

Vegetation Class: Oceanic Rainforests

Status: Not listed

On Lord Howe Island this community has been divided into two variants, including 12a – Kentia Palm Forest on coral sand and calcarenite, and 12b – Banyan - Kentia Palm Forest on coral sand and calcarenite. Both of these variants have been mapped within the study area. A third variant, although not mapped by Sheringham et al. 2016, consists of an emergent layer of *Araucaria heterophylla* (Norfolk Island Pine).

5.2.5.1. Variant 12a: Kentia Palm Forest on Coral Sand and Calcarenite

Within the study area, this community occurs in both the North and South zones. It occurs as a mid-high closed forest dominated by *Howea forsteriana* (Kentia Palm) with rare emergent *Ficus macrophylla* subsp. *columnaris* (Banyan). Other tree species sparsely scattered within the community include *Drypetes deplanchei* (Greybark), *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt), *Celtis conferta* subsp. *amblyphylla* (Cotton-wood), *Elaeodendron curtipendulum* (Tamana) and *Lagunaria patersonia* (Norfolk Island Hibiscus).

The mid and lower layers of the community are predominantly represented by different aged cohorts of Kentia Palm. The ground is densely covered by fallen palm fronds however, shrubs species such as *Cassinia tenuifolia* (Bully Bush), *Myoporum insulare* (Common Boobialla) and *Ochrosia elliptica* (Red Berrywood) are present, although typically in low abundance. Other species scattered within the understorey include *Ficinia nodosa* (Knobby Club-rush), *Commelina cyanea* (Native Wandering Jew), *Jasminum didymum* subsp. *didymum, Crinum pedunculatum* (Swamp Lily), *Geitonoplesium cymosum* (Scrambling Lily) and *Smilax australis* (Lawyer Vine).

Several exotic species are also present within the community, although typically adjacent to exotic vegetation and cleared areas around the periphery of the community. Dominant exotic species include *Ehrharta erecta* (Panic Veldtgrass), *Sporobolus africanus* (Parramatta Grass), *Hydrocotyle bonariensis*, *Hypochaeris radicata* (Catsear), *Conyza parva* (Fleabane) and *Euphorbia peplus* (Petty Spurge). In places this community is regenerating following the removal of introduced *Araucaria heterophylla* (Norfolk Island Pine) trees, and these regrowth areas are generally more open, and have a greater abundance of exotic weeds.

An example of the community within the study area is shown in Photograph 8.

Photograph 8 Variant 12a Kentia Palm – Banyan Forest on coral sand and calcarenite within the study area

5.2.5.2. Variant 12b: Banyan – Kentia Palm Forest on Coral Sand and Calcarenite

Variant 12b is restricted to the far north of the North Zone where it is restricted to a steep slope on calcarenite, where there is extensive exposed calcarenite. This variant has an emergent layer of *Ficus macrophylla* ssp. *columnaris* over a canopy dominated by *Howea forsteriana* (Kentia Palm). Other species present in the canopy, but not dominant, include *Drypetes deplanchei* (Greybark), *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt), *Celtis conferta* subsp. *amblyphylla* (Cotton-wood), *Balogia inophylla* and *Lagunaria patersonia* (Norfolk Island

Hibiscus). The ground layer is sparse to absent due to the dense layer of litter and woody debris present, although the fern *Asplenium milnei* grows within exposed calcarenite.

An example of the community within the study area is shown in Photograph 9.

Photograph 9 Banyan-Kentia Palm Forest on Coral Sand and Calcarenite in the North Zone

5.2.5.3. 12a/Exotic: Kentia Palm Forest on Coral Sand and Calcarenite with Emergent *Araucaria heterophylla*

This community is largely the same a Variant 12a, but differs in having an emergent layer of tall, planted *Araucaria heterophylla* (Norfolk Island Pine) at around 40 m tall. It is restricted to the North Zone adjacent to Lagoon Road. The canopy is dominated by *Howea forsteriana* (Kentia Palm). Other species present in the shrub layer include *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt), *Lagunaria patersonia* (Norfolk Island Hibiscus), *Melaleuca howeana* and *Jasminum didymum* subsp. *didymium*. Within the subject land this community has a more degraded understorey with exotic grasses present such as *Cenchrus clandestinus* (Kikuyu Grass).

An example of the community within the study area is shown in Photograph 10.

Photograph 10 Kentia Palm Forest on Coral Sand and Calcarenite with Emergent *Araucaria heterophylla* within the North Zone

5.2.6. Greybark – Blackbutt rainforest at low to intermediate altitudes

Community #: 17a, 17b

Scientific Name: *Drypetes deplanchei – Cryptocarya triplinervis var. triplinervis – Olea paniculata – Celtis conferta subsp. amblyphylla / Myrsine platystigma – Alyxia ruscifolia / Smilax australis – Parsonsia howeana – Jasminum didymum subsp. didymum / Oplismenus imbecillis – Asplenium milnei – Carex brunnea*

Vegetation Formation: Rainforests

Vegetation Class: Oceanic Rainforests

Status: Not listed

On Lord Howe Island this community has been divided into three variants, including 17a – Greybark - Blackbutt low closed forest on exposed basalt slopes, 17b – Greybark - Blackbutt low closed forest on exposed basalt slopes, and 17c Greybark - Blackbutt low closed forest on exposed calcarenite. These variants differ structurally depending on the substrate and degree of exposure. Two of these variants have been mapped within the study area including variant 17a and 17b.

5.2.6.1. Variant 17a: Greybark – Blackbutt Rainforest

This variant is restricted to the South Zone. Of the two variants, Variant 17a is taller and more species rich, occurring on sheltered to intermediate aspects on deeper soils derived from basalt, breccia and calcarenite. Within the study area, the dominant tree species include *Celtis conferta* subsp. *amblyphylla* (Cottonwood),

Drypetes deplanchei (Greybark), *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt) and *Planchonella howeana* (Axe-handle Wood). Dominant shrub species within the community include *Alyxia ruscifolia* (Prickly Alyxia), *Myrsine platystigma* and *Ochrosia elliptica* (Red Berrywood). Other species occurring within the understorey include the vines *Howea forsteriana* (Kentia Palm), *Flagellaria indica* (Whip Vine), *Jasminum didymum* subsp. *didymum, Geitonoplesium cymosum* (Scrambling Lily), *Parsonsia howeana, Smilax australis* (Snake Vine), *Trophis scandens* subsp. *megacarpa* and the forb *Commelina cyanea* (Native Wandering Jew). The palm *Howea forsteriana* (Kentia Palm) forms only a minor component of the understorey. The native grass *Oplismenus imbecillis* was also recorded within the community.

This variant was comprised of few exotic species, with the most abundant species including *Ehrharta erecta* (Panic Veldtgrass), *Ipomoea cairica, Physalis peruviana* (Cape Gooseberry), *Solanum nigrum* (Black-berry Nightshade) and *Stenotaphrum secundatum* (Buffalo Grass).

An example of the 17a variant within the study area is shown in Photograph 11.

Photograph 11 Variant 17a Greybark – Blackbutt rainforest within the study area

5.2.6.2. Variant 17b: Greybark – Blackbutt low closed forest on exposed basalt slopes

This variant occupies exposed sites on ridges and areas exposed to the ocean. It is often a low, viney, near-impenetrable scrub of Greybark and Hopwood. This variant is most common in the northern hills, less common in the central lowlands and southern mountains.

Within the study area, this community occurred as a single small patch on the corner of Old Lagoon Road and Lagoon Road within the South Zone. The community consists of a low closed forest of *Dodonaea viscosa* subsp.

burmanniana (Hopwood). Other native species sparsely scattered within the community included seedlings or saplings of the trees *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt), *Lagunaria patersonia* (Norfolk Island Hibiscus) and *Drypetes deplanchei* (Greybark), the shrubs *Ochrosia elliptica* (Red Berrywood) and *Coprosma prisca* (Goatwood) and the vine *Stephania japonica* (Snake Vine). The exotic species *Ipomoea cairica* (Coastal Morning Glory) was also present within the community.

An example of the 17b variant within the study area is shown in Photograph 12.

Photograph 12 Variant 17b Greybark – Blackbutt low closed forest on exposed basalt slopes

5.2.7. River Mangrove tall shrubland of brackish creeks

Community #: 21

Scientific Name: *Aegiceras corniculatum*

Vegetation Formation: Saline Wetlands

Vegetation Class: Mangrove Swamps

Status: Not listed

Within the study area this community occurs along Cobby's Creek within the South Zone. The community is characterised by the presence of *Aegiceras corniculatum* (River Mangrove), with scattered occurrences of *Hibiscus tiliaceus* (Cottonwood Hibiscus). The native grass *Sporobolus virginicus* is present along the fringes of the community.

An example of the community within the study area is shown in Photograph 13.

Photograph 13 River Mangrove tall shrubland within the study area

5.2.8. Environmental Plantings

Environmental plantings within the study area are located along existing fences adjacent to the Lord Howe Island airport runway and along the northern side of Old Lagoon Road and eastern side of Airport Road. Environmental plantings comprise a mixture of different native species, which have been planted in rows along the fence lines to form screening/hedges/windbreaks and around existing buildings. Some of this vegetation may include remnant native vegetation that has been modified by trimming to form hedges. Species within this community include *Howea forsteriana* (Kentia Palm), *Melaleuca howeana* (Tea Tree), *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt), *Lagunaria patersonia* (Norfolk Island Hibiscus) and *Cassinia tenuifolia* (Bully Bush).

An example of environmental plantings within the study area is provided in Photograph 14.

Photograph 14 Environmental plantings within the subject land in the South Zone maintained through heavy trimming

5.2.9. Plantations

Plantations consist of plantations of *Howea forsteriana* (Kentia Palm) established as seed orchards for seed production in the past. They consist of even-aged and evenly spaced palms, with few other species present below. Evidence of irrigation and tree stakes are still visible within the community. Within the South Zone the canopy is comprised almost entirely of Kentia Palms that are of the same age and are relatively evenly spaced, with scattered occurrences of *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt), *Hibiscus tiliaceus* (Cottonwood Hibiscus) and *Lagunaria patersonia* (Norfolk Island Hibiscus). The mid layer is largely absent, with the exception of *Howea forsteriana* (Kentia Palm) as well as scattered occurrences of *Dodonaea viscosa* subsp. *burmanniana* (Hopwood) and *Alyxia ruscifolia* (Prickly Alyxia). Other native species recorded within the community include *Jasminum didymum* subsp. *didymum*, *Parsonsia howeana* and *Stephania japonica* (Snake Vine). The exotic species *Ehrharta erecta* (Panic Veldtgrass), *Ipomoea cairica* (Coastal Morning Glory) and *Oxalis corniculata* (Creeping Oxalis) were also present.

Within the North Zone, other than *Howea forsteriana*, the few species present include *Alyxia ruscifolia* (Prickly Alyxia, *Parsonia howeana*, *Lagunaria patersonia* (Norfolk Island Hibiscus) and the introduced grass *Ehrharta erecta* (Panic Veldtgrass). In one location along Lagoon Road the ground layer is maintained as exotic grassland.

An example of plantations within the study area is provided in Photograph 15 and Photograph 16.

Photograph 15 Plantation with the North Zone consisting of similarly aged and evenly spaced *Howea forsteriana*

Photograph 16 Plantation with the South Zone consisting of similarly aged and evenly spaced *Howea forsteriana*

5.2.10. Exotic Vegetation

Exotic vegetation is present within the study area in both the North and South Zone and consists predominantly of managed grasslands. These areas are dominated by exotic grasses including *Cenchrus clandestinus* (Kikuyu Grass), *Poa annua* (Winter Grass, *Stenotaphrum secundatum* (Buffalo Grass), *Sporobolus africanus* (Parramatta Grass) *Eleusine indica* (Crowsfoot Grass) and *Chloris gayana* (Rhodes Grass). Other exotic species recorded in high abundances included *Trifolium repens* (White Clover), *Hydrocotyle bonariensis*, *Hypochaeris radicata* (Catsear), *Oxalis corniculata* (Creeping Oxalis) and *Taraxacum officinale* (Dandelion).

The exotic tree, *Araucaria heterophylla* (Norfolk Island Pine) is also present as an emergent tree at various locations including along Lagoon Road and at the entrance to the airport. In such locations, these trees occur as a canopy over managed exotic grassland. There is also minor area of exotic plantings consisting of *Hibiscus rosa-sinensis*, and other ornamental plantings.

In places these grasslands are managed by mowing, but unmown areas are also present.

An example of the community within the study area is shown in Photograph 17 and Photograph 18.

Photograph 17 Exotic vegetation within the North Zone comprised of managed grassland

Photograph 18 Exotic vegetation within the South Zone comprised of managed grassland beneath Norfolk Island Pines

5.3. Threatened Ecological Communities

One vegetation community identified within the study area, Sallywood Swamp Forest, occurs on poorly drained, low-lying areas and conforms to the TEC Lagunaria Swamp Forest on Lord Howe Island, which is listed as a Critically Endangered Ecological Community (CEEC) under the BC Act. This community occupies 0.03 ha within the southern portion of the study area adjacent to Cobbys Creek. The community is not present within the subject land.

The distribution of the community is restricted on Lord Howe Island to low-lying swampy areas at altitudes below 20 m. This distribution was mapped by Pickard (1983), who estimated that its original distribution may have covered as little as 6 ha distributed across five restricted locations on the island (NSW Scientific Committee, 2010). None of these locations are protected within the Lord Howe Island Permanent Park Preserve, but Lagunaria Swamp Forest on Lord Howe Island falls entirely within the jurisdiction of the LHIB. Individual plants of Lagunaria patersonia may be scattered through the forests from sea level to about 600m elevation on Lord Howe Island, but such locations do not form a part of the Lagunaria Swamp Forest community (NSW Scientific Committee, 2010).

Lagunaria Swamp Forest on Lord Howe Island has been seriously depleted by land clearing at all sites of its occurrence. The remaining fragments are only a few square metres in area, are degraded by edge effects, weed invasion, alteration to water regimes and from cattle grazing. The community has been eliminated from some of its original locations, including an area behind Blinky Beach, which was cleared in 1975 during construction of the airstrip. The remnants are likely to include only a sample of the original flora and at least some appear to be transitional assemblages with other vegetation communities. However, since the initial listing of the

community as Endangered in 2003 (the highest category then available), there has been a number of restoration activities undertaken by the LHIB to begin to restore this community. Actions have involved habitat plantings and fencing of remnants, or in some cases previously occupied habitat, in order to exclude cattle (NSW Scientific Committee, 2010).

Lagunaria Swamp Forest is only listed as a TEC under the BC Act. It is not listed as a TEC under the EPBC Act. Furthermore, no other native vegetation communities within the study area or on Lord Howe Island conform to a TEC under the EPBC Act. The location of the Lagunaria Swamp Forest within the study area is shown in Figure 11.

5.4. Vegetation Integrity Assessment

A vegetation integrity assessment cannot be completed in accordance with the BAM as the vegetation cannot be classified by PCTs. Vegetation integrity scores are calculated by the BAM-C, once BAM plot data collected during field surveys has been entered. While BAM plots have been completed to allow an analysis of the composition, structure and function of vegetation communities, the data collected from BAM plots cannot be entered into the BAM-C as PCTs cannot be assigned. Therefore, the identification of vegetation zones and subsequent vegetation integrity scores does not apply.

6. Threatened and Migratory Species

The BAM cannot be applied to biodiversity endemic to Lord Howe Island and as such ecosystem and species credit species cannot be identified using the BAM-C. Therefore candidate (ecosystem) or predicted (species) species credit species have not been identified in this assessment.

Instead, a list of potentially occurring threatened flora and fauna as well as migratory fauna was determined using the NSW BioNet Atlas and Commonwealth PMST and assessed in the FFA provided in **Appendix A.** As part of the FFA, a likelihood of occurrence assessment was undertaken to determine the likelihood of threatened and/or migratory species occurring within the subject land. Where a species could be excluded due to an absence of records, or following field surveys, it was determined that the habitat was degraded, or there was an absence of species-specific habitat requirements, then the species was identified as having a low likelihood of occurrence and subsequently excluded from further assessment.

The following sections provide a summary of the threatened flora and fauna species and migratory species identified within the FFA as having a moderate or high likelihood of occurrence, or are known to occur within the subject land. Further assessment including tests of significance in accordance with the BC Act are provided within the FFA in **Appendix A**, while further assessment of MNES is included within **Appendix B**.

6.1. Threatened Flora

The NSW BioNet Atlas holds records of three threatened flora species listed under the BC Act within the assessment area. A further eight species have been recorded on Lord Howe Island. Most of these species are considered to have a low likelihood of occurrence as previous records on Lord Howe Island are at high altitudes on Mt Lidgbird and Mt Gower, and therefore suitable habitat for these species is not available within the subject land. However, two species are considered to have a moderate likelihood of occurrence due to the presence of suitable habitat. This includes:

- Knicker Nut (*Caesalpinia bonduc*), listed as Endangered under the BC Act; and
- Sand Spurge (*Chamaesyce psammogeton*), listed as Endangered under the BC Act.

Despite the presence of suitable habitat for the above listed species, detailed targeted threatened flora surveys conducted in the subject land and wider study area did not record any of the threatened flora species known to occur on Lord Howe Island. As such, this assessment concludes that no threatened flora species listed under the BC Act and/or EPBC Act are likely to occur in the subject land or be impacted by the Project.

6.2. Threatened Fauna Species

The NSW BioNet Atlas holds records of 33 threatened fauna species listed under the BC Act and/or EPBC Act within the assessment area. As the assessment area includes some ocean areas, the search yielded numerous marine species which are not relevant to an assessment of terrestrial ecology within the study area and therefore have not been considered further in this report.

Seven threatened fauna species (all birds) listed under the BC Act were recorded within the subject land during field surveys as listed in Table 7. An additional six threatened species were recorded within the study area. The location of threatened fauna species recorded within the study area is shown on Figure 12. It is noted that records of threatened birds include the location that birds were recorded by the observers, and not necessarily the location of individual species. An additional nine threatened bird species were identified within the FFA in **Appendix A** as having the potential to occur based on previous records within a 5km locality and the presence of suitable habitat, however as these species were not identified within the subject land or study area during targeted surveys, these species were not considered likely to rely on the habitat within the subject land and therefore have not been assessed further.

One threatened species, the Masked Booby (*Sula dactylatra*) was recorded at a survey site within the subject land, however this species was observed flying over the lagoon and not within the subject land. Given the roosting/breeding sites for the species are well known and are not located within the subject land, and suitable foraging habitat is not available within the subject land, the species has not been assessed as occurring within the subject land.

Table 7 Threatened fauna species that are known to occur within the subject land and study area

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Study Area	Subject Land
Land Birds (Resident Forest and Woodland Species)					
Hypotaenidia sylvestris	Lord Howe Woodhen	E	E	X	X
Pachycephala pectoralis contempta	Golden Whistler (Lord Howe Is. subsp.)	V	-	X	X
Strepera graculina crissalis	Pied Currawong (Lord Howe Is. subsp.)	V	V	X	X
Zosterops lateralis tephropleurus	Silvereye (Lord Howe Is. subsp.)	V	-	X	X
Seabirds (Migratory and Marine Species)					
Arenaria interpres	Ruddy Turnstone	V	V, M	X	-
Gygis alba	White Tern	V	-	X	X
Limosa lapponica baueri	Bar-tailed Godwit	E	E, M	X	-
Onychoprion fuscata	Sooty Tern	V	-	X	X
Pterodroma nigripennis	Black-winged Petrel	V	-	X	X
Sula dactylatra	Masked Booby	V	M	X	-
Invertebrates (Molluscs)					
Placostylus bivaricosus	Lord Howe Placostylus	E	E	X	-
Reptiles					
Christinus guentheri	Lord Howe Island Gecko	V	V	X	-

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Study Area	Subject Land
Oligosoma lichenigera	Lord Howe Island Skink	V	V	X	-

V = Vulnerable, E = Endangered, M=Migratory

6.2.1. White Tern

The White Tern (*Gygis alba*) was recorded roosting and breeding within the subject land. The species typically uses the exotic Norfolk Island Pine trees for roosting and breeding, laying eggs on bare branches. The species may also utilise bare branches on native trees and shrubs for nesting/roosting, although all individuals identified during field surveys were recorded within the Norfolk Island Pine trees. The species was recorded in high numbers, with more than ten individual birds recorded within each of the Norfolk Island Pine trees within the subject land. The species was also recorded flying between nest trees and foraging sites across the lagoon.

6.2.2. Lord Howe Woodhen

The Lord Howe Woodhen occurs within all vegetation communities within the subject land, as well as in cleared land and on beaches. The species has become highly abundant across the island following the eradication of the Black Rat (*Rattus rattus*), with nearly 6,000 records of the species in the locality held within the NSW BioNet. While the population of the species was reduced to just nine breeding pairs in the 1970s, the latest survey undertaken in December 2024 recorded at least 1,638 woodhens, including 1,535 adults and juveniles and 26 chicks. The species was regularly observed foraging and roosting within the wider study area and subject land as well as modified urban habitats around the community including sporting fields, garden beds and golf courses.

6.2.3. Golden Whistler (Lord Howe Is. subsp.)

The Golden Whistler (Lord Howe Is. subsp.) was recorded within the native vegetation of the subject land and wider study area. No nests were observed within the subject land, and therefore this species is likely to utilise the subject land for foraging only. Given the Golden Whistler (Lord Howe Is. subsp.) is a highly mobile species it would likely utilise the subject land as part of a much broader foraging range.

6.2.4. Pied Currawong (Lord Howe Is. subsp.)

The Pied Currawong (Lord Howe Is. subsp.) was recorded within the native vegetation of the subject land and wider study area. No nests were observed within the subject land, and therefore this species is likely to utilise the subject land for foraging only. Given the Pied Currawong (Lord Howe Is. subsp.) is a highly mobile species it would likely utilise the subject land as part of a much broader foraging range.

6.2.5. Silvereye (Lord Howe Is. subsp.)

The Silvereye (Lord Howe Is. subsp.) was recorded within the native vegetation of the subject land and wider study area. No nests were observed within the subject land, and therefore this species is likely to utilise the subject land for foraging only. Given the Silvereye (Lord Howe Is. subsp.) is a highly mobile species it would likely utilise the subject land as part of a much broader foraging range.

6.2.6. Sooty Tern

The Sooty Tern (*Onychoprion fuscata*) was recorded aerially above the subject land, in transit between foraging sites. Roosting and breeding sites for this species on Lord Howe Island are well known and not located within the subject land. As such the Sooty Tern is unlikely to rely on habitat within the subject land.

6.2.7. Black-winged Petrel

The Black-winged Petrel (*Pterodroma nigripennis*) was recorded aerially above the subject land, in transit between foraging sites. Roosting and breeding sites for this species on Lord Howe Island are well known and not located within the subject land. As such the Black-winged Petrel is unlikely to rely on habitat within the subject land.

6.2.8. Lord Howe Placostylus

The Lord Howe Placostylus was recorded on 41 occasions during targeted spotlighting surveys within the study area and in immediately adjoining vegetation in July and December 2024 and February 2025. This species is predominantly recorded in the South Zone in vegetation adjoining the existing WMF, within the study area. Within the North Zone, the species has only been recorded in vegetation between the boat ramp and Old Settlement Beach outside of the subject land. The species was identified within the same few locations across multiple survey periods and despite thorough searches in surrounding areas, the area of occupancy did not increase. The Lord Howe Placostylus was not recorded within the subject land in either the North or South Zone. Within the South Zone, records within the study area included individual snails that were identified along the existing access road north of the T-junction. Large numbers of empty Lord Howe Placostylus shells were also identified within the subject land, suggesting these areas comprise suitable habitat and would have been occupied by the species prior to the invasion of Black Rat.

6.3. Migratory Fauna Species

One migratory species, the Wedge-tailed Shearwater (*Ardenna pacifica*) was recorded within the subject land in the North Zone and has been identified within the Referral decision as requiring further assessment. Known roosting and breeding habitat is present in the subject land within the North Zone however is not present within the South Zone. This species is known to roost within the subject land and wider study area, arriving on Lord Howe Island in September and departing in May. An additional eight migratory species (three of which are also listed as threatened species) were recorded within the study area, particularly along the lagoon foreshore. The migratory fauna species listed under the EPBC Act recorded within the subject land and study area during field surveys are listed in **Table 8**. The location of migratory fauna species recorded within the study area is shown on Figure 13. It is noted that records of migratory birds include the location that birds were recorded by the observers, and not necessarily the location of individual species.

Table 8 Migratory fauna species that are known to occur within the subject land and study area

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Study Area	Subject Land
Wedge-tailed Shearwater	*Ardenna pacifica*	-	M	X	X

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Study Area	Subject Land
Ruddy Turnstone	*Arenaria interpres*	V	V, M	X	-
Bar-tailed Godwit	*Limosa lapponica baueri*	E	E, M	X	-
Masked Booby	*Sula dactylatra*	V	M	X	-
Common Noddy	*Anous stolidus*	-	M	X	-
Wandering Tattler	*Tringa incana*	-	M	X	-
Double-banded Plover	*Charadrius bicinctus*	-	M	X	-
Pacific Golden Plover	*Pluvialis fulva*	-	M	X	-
Whimbrel	*Numenius phaeopus*	-	M	X	-

V=Vulnerable, E=Endangered, M=Migratory

The NSW BioNet and EPBC PMST search identified a combined 58 migratory species with potential to occur within the locality. The locations of previous records of migratory fauna within the locality as well as an assessment of likelihood of occurrence based on habitat requirements and known records are provided within the FFA in **Appendix A**. The assessment indicates that the majority these species have a low likelihood of occurrence within the subject land due to either a lack of suitable habitat resources and/or lack of known records from the locality. However, 26 migratory fauna species are considered to have potential to occur due to the presence of suitable habitat and recent nearby records or are known to occur having been recorded during targeted fauna surveys. The majority of these potentially occurring species are considered likely to occur aerially in transit across the subject land, rather than utilising the foraging and roosting/breeding habitat available within the subject land.

7. Prescribed Impacts

Prescribed impacts are identified in Clause 6.1 of the BC Regulation. Prescribed impacts are those that are additional to the clearing of native vegetation and associated habitat. These include:

- Development on the habitat of threatened species or ecological communities associated with:
    - karst, caves, crevices, cliffs, rock outcrops and other geological features of significance;
    - human-made structures;
    - non-native vegetation.
- Development on areas connecting threatened and migratory species habitat, such as movement corridors;
- Development on water quality, water bodies and hydrological processes that sustain threatened species and TECs (including from subsidence or upsidence from underground mining);
- Vehicle strikes on threatened and/or migratory species.

An assessment of the relevance of these prescribed impacts to the Project is provided in **Table 9.**

Table 9 Relevance of prescribed impacts

Prescribed Impact	Present	Feature Characteristic and Location	Potential Impact	Associated Threatened Entities	Section of BDAR Where Addressed
Karst, caves, crevices, cliffs, rock outcrops and other geological features of significance	No	No features have been identified within the subject land from topographic maps or field surveys.	Not relevant.	N/A	N/A
Human-made structures	Yes	Old buildings and sheds are present within the subject land. This includes the marine infrastructure buildings in the North Zone and existing waste facility in the South Zone.	Relevant. The removal of human made structures within the subject land will remove potential shelter habitat for native fauna. While threatened reptiles have not been recorded within the subject land potential habitat is available which will be lost.	Threatened reptiles, Lord Howe Placostylus and Lord Howe Woodhen.	Section 8.3.1
Non-native vegetation	Yes	The Project has been sited predominantly within cleared areas and areas containing exotic vegetation to minimise impacts on native vegetation. As such, approximately 1.81 ha of exotic vegetation will be removed, including 0.33 ha within the North Zone and 1.48 ha within the South Zone. Exotic vegetation to be removed is comprised predominantly of mown/managed grasslands.	Relevant. The removal of exotic vegetation will remove potential foraging habitat for threatened species such as the Lord Howe Woodhen which is known to forage within mown grasslands	Lord Howe Woodhen.	Section 8.3.2
Habitat connectivity	Yes	Native vegetation will be removed within the subject land which will reduce habitat	Relevant. Native vegetation will be removed which will result in habitat within the subject	Threatened birds, reptiles and the	Section 8.3.3

Prescribed Impact	Present	Feature Characteristic and Location	Potential Impact	Associated Threatened Entities	Section of BDAR Where Addressed
		connectivity in the short term. Within both the North and South Zones habitat connectivity will be impacted primarily along the upper banks of the Lagoon.	land becoming fragmented. However, most species affected are birds that are highly mobile and capable of moving between retained patches of native vegetation. Less mobile species such as the Lord Howe Island Skink, Lord Howe Island Gecko and the Lord Howe Placostylus have not been recorded within the subject land, however the loss of potential habitat could restrict movement of these species between areas of potential habitat. Nevertheless, this is only expected to be a short-term impact, as revegetation is proposed as part of the Project's Landscape Plan to ensure there is no net loss of native vegetation and associated habitat.	Lord Howe Placostylus.	
Waterbodies, water quality and hydrological processes	Yes	The subject land includes a portion of the Lord Howe Island Lagoon which is part of the Tasman Sea. One other waterway known as Cobbys Creek is located in proximity to the subject land, however is unlikely to be impacted by the Project.	Relevant. The Project has the potential to result in increased sedimentation and runoff during construction and operational phases. Furthermore, the construction of the new jetty will result in disturbance to the Lagoon which is likely to increase the turbidity of the water. These are expected to be short-term impacts and suitable mitigation measures will be implemented.	Threatened birds	Section 8.3.4

Prescribed Impact	Present	Feature Characteristic and Location	Potential Impact	Associated Threatened Entities	Section of BDAR Where Addressed
Wind turbine strikes	No	Not relevant	The Project does not comprise a wind farm development.	N/A	N/A
Vehicle strikes	Yes	Vehicular access will be provided within both the North and South Zone. This will include loading and unloading bays as well as access to the public boat ramp in the North Zone, and drop of and working zones within the WMF in the South Zone.	Relevant. While the Project is unlikely to result in an increase in vehicle movements beyond current conditions, the Project has been designed to facilitate the movement of vehicles within both the North and South Zones. Within these areas, vehicular movements are expected to be very slow, mostly limited to forklift activity, public access to the boat ramp and waste drop off. The number of vehicles on Lord Howe Island is minimal, with most traffic limited to resident vehicles and tourist vans. Furthermore, speed limits on the island are enforced as most transport on the island is by bicycle or on foot, with top speeds of 25km/hr. As such, it is unlikely that vehicle strikes would be increased beyond current conditions. Further details on vehicle speeds and mitigation measures are provided in the Transport and Traffic Assessment (Amer Organisation, 2025).	Lord Howe Woodhen	Section 8.3.5

8. Avoid and Minimise

The Project has been through several design iterations to ensure areas of highest ecological value have been avoided by the Project. Community consultation and co-design have been key driving factors for the Project given the unique location and needs of the island. During the design phase, the Project team has undertaken genuine and transparent communication with the Lord Howe Island community as well as Government departments, including the LHIB, DPHI, DPIRD – Marine Parks and Agriculture and Biosecurity, Transport for NSW, NSW and Commonwealth DCCEEW. During this process, the project team has been required to show innovative thinking in all aspects of the design options conceptual master planning. Furthermore, the Project has considered staging and requirements for the continued operation of the current WMF and marine freight service (MV Island Trader) until the Project has been completed and new services are operational.

Initial Project planning included the development of business cases for the marine infrastructure and the WMF which have been subject to several design iterations to minimise impacts to native vegetation and habitat whilst meeting the needs of the Project. These are detailed further below while a comparison of the original disturbance footprint and the subject land is shown in **Figure 14**.

8.1. Marine Infrastructure and Biosecurity Facilities

The marine infrastructure business case assessed multiple options about the location of the marine infrastructure in consideration of the freight vessel, new wharf and cargo laydown areas. These options included sites within the North Zone, South Zone and at Blinky Beach on the eastern side of the island. Following the completion of detailed technical studies, as well as meetings with the Lord Howe Island Board, the South Zone was ruled out as a viable option for several reasons.

Primarily, it would be difficult to safely transfer cargo due to unpredictable tides and greater wave heights (when compared to the North), which would pose a greater risk to WHS during loading and unloading operations. Additionally, the South Zone required the design of infrastructure that was deemed of a higher impact, leading to higher costs, and no-back up option, should the infrastructure require maintenance or upgrade (unlike the North Zone where there is the lift-on lift-off alternative with the existing jetty).

The operational and environmental challenges were also significant, including excessive construction costs due to the required ramp length (over 172m) and the environmental impact by creating a new shipping channel. Community and government feedback further contributed to the decision, with concerns about visual impacts, reputational risks, and environmental damage. The South Zone was also less likely to meet environmental approvals due to the impact it would have on a pristine environment. In comparison, the North Zone was identified as a more feasible option, with the use of the existing channel which the current MV Island Trader navigates, and proposed development in an already disturbed (partly) area.

Once it was determined that the marine infrastructure would be located within the North Zone, further design options were prepared that explored how a new piled vessel ramp could be incorporated within the existing marine infrastructure include the existing jetty. This included:

- New piled vessel ramp north of the existing jetty;
- New angled piled vessel ramp north of the existing jetty, with the existing jetty partially removed;

- New piled vessel ramp immediately to the south side of the existing jetty; and
- New piled vessel ramp on the end of the existing jetty and replacing the deck of the existing jetty and strengthening as required.

The ongoing iterative design process has considered a number of design options that have incorporated and responded to the following general assumptions for the marine infrastructure and biosecurity facilities in the North Zone. The challenge is to ensure the competing demands of the site including marine and agency operations, recreation, tourism and the masterplan.

1. **Safety:** All design options are to ensure the final design prioritises the overall safety of residents, tourists and workers, with new and improved operational procedures as well as the upgrade to the existing staging area and cargo laydown. The proposed unloading area must be secured, so as not to allow public access, including tourists, to mix with operational activities when the freight vessel is docked (3 days per fortnight).
2. **Essential Marine Operations & Recreational Uses:** Existing marine operations are to remain as they are currently in the North Zone. In particular, the Marine Rescue shed is to remain in operation at all times, as well as access to the public boat ramp, and access to the foreshore and beach.
3. **Protecting & Enhancing the Surrounding Environment:** Biosecurity practices will be enhanced through the design, and the existing jetty is incompatible with potential new methods of unloading. The new cargo laydown area will accommodate improvements for spill containment, avoiding environmental damage and contamination by both public and commercial users and improving the recreational experience along the foreshore and beach access.
4. **Retain Existing Scale & Character:** Retain the existing scale and character of the North Zone. The heritage-listed office building is an asset, and its original features should be preserved. The Norfolk Pines and jetty are a valuable landscape feature that should be incorporated into the final design option.

In addition to the above considerations, the Project has also been through multiple design changes to minimise impacts to native vegetation and habitat for threatened species. While some native vegetation is required to be removed to cater for the expanded hardstand and new piled vessel ramp, the Project will retain the majority of native vegetation within the North Zone, including larger patches of native vegetation as well as the dense shrubby vegetation along the foreshore and Norfolk Island Pine trees.

While the Project has identified a disturbance footprint for the marine infrastructure, this is considered to be the maximum area of disturbance required. Given further design changes are expected, efforts to retain additional native vegetation and habitat within the subject land will be undertaken.

8.2. Waste Management Facility

Design options for the WMF have been developed together with the consultant Project team including SMEC engineers, architect, landscape architect and the waste management team on the LHI Board. The design process has also entailed comprehensive community feedback through on-island community engagement sessions and workshops. The iterative design process has considered a number of design options that have incorporated and responded to the following general assumptions for the facility.

- Construction of the building needs to be very simple and repetitive, ideally to allow for offsite fabrication and ease of assembly on-site;
- Visually it needs to be simple and recessive taking into consideration the view from the air;
- The activities within the WMF are progressive and should be in a single linear arrangement which conforms with the existing WMF footprint;
- The native vegetation and associated habitat are constraints that the facility needs to be designed around;
- The facility should be column free, if possible, to maximise flexibility and avoid damage from machinery (i.e. forklifts) moving around;
- There is only room for a single road in and out; and
- The public are restricted to the drop-off area except through prior arrangement.

The preferred design option for the WMF within the South Zone, including the proposed dog kennel facility, has been refined since the initial concept plans, following the completion of vegetation mapping as well as other technical studies. Where possible, existing native vegetation has been retained, including vegetation on the eastern side of the WMF which will maintain the character around the site and help provide screening from scenic lookouts on the island (i.e. Transit Hill).

While the Project has largely been situated within previously cleared areas, the disturbance footprint has included areas of the South Zone that require remediation due to contamination. Many of these areas are only proposed to be impacted because of the remediation and are not required for the construction and operation of the WMF. As such, these areas will be revegetated in accordance with the Project's Landscape and Urban Design Plans and include replanting with only local provenance plant material grown on the island.

It is noted that within the South Zone, the subject land includes areas mapped as native vegetation along the existing access road. These areas comprise overhanging canopy from trees along the existing access road. No works are proposed to be undertaken along the existing access road, which will only be used in its current condition if required to transport equipment. Therefore, the Project will not impact the native vegetation or associated habitat along the existing access road.

8.3. Avoid and Minimise Prescribed Impacts

Human-made structures, habitat connectivity, non-native vegetation, water bodies, water quality and hydrological processes and vehicle strikes have been identified as prescribed impacts relevant to the Project. Measures to avoid and minimise these prescribed impacts are considered individually below. The location of prescribed impacts is shown in **Figure 14**.

8.3.1. Human-Made Structures

Given the design requirements of the Project, some of the existing human-made structures are required to be removed and therefore impacts to these structures are not able to be avoided by the Project. Within the North Zone, none of the existing human-made structures are proposed to be removed. However, all of the human-

made structures in the South Zone are proposed to be removed and subsequently replaced within additional structures. Nevertheless, the human-made structures planned to be demolished are not considered essential for the survival of any of the potentially occurring impacted species and adequate mitigation measures (as discussed in ***Section 9.7.1***) will be implemented to minimise the impact to fauna (if any) that may utilise the existing human-made structures for shelter.

8.3.2. Non-Native Vegetation

The Project has been through multiple design iterations to minimise impacts on native vegetation and habitat, and as a result has been positioned predominantly within cleared areas and areas of non-native vegetation. The non-native vegetation within the subject land is predominantly in the form of managed lawns, with some smaller scattered areas of woody vegetation. Although the non-native vegetation may provide some habitat value for native fauna in terms of foraging resources, these areas are unlikely to be favoured over the woodland habitats outside of the subject land within the assessment area of the Project. Hence, impacts to the areas of non-native vegetation are not able to be avoided as part of the Project. It is noted that a Site Establishment Management Plan and/or Staging Report will be prepared prior to construction which will confirm the full extent of non-native vegetation to be impacted by the Project.

8.3.3. Habitat Connectivity

As explained in previous sections, when considering the requirements associated with the Project in combination with the location on a highly biodiverse island, there are limited opportunities to avoid impacts on native vegetation and associated habitat connectivity. Nevertheless, the Project has been designed to utilise cleared areas and avoid clearing of native vegetation to the largest extent possible whilst meeting the requirements of the Project. Furthermore, habitat connectivity will be enhanced in the longer term with the establishment of landscape plantings as discussed in ***Section 9.7.2.*** Therefore, although there will be some minor reduction in the overall habitat connectivity supported by the subject land, the overall subject land will continue to function as stepping-stone habitat between larger patches of woodland in the wider landscape in the long-term.

8.3.4. Water Bodies, Water Quality and Hydrological Processes

The Project has the potential to result in increased sedimentation and runoff during construction and operational phases. Given the requirements of the Project to construct a new piled vessel ramp and upgrade the existing jetty, impacts on the lagoon are unavoidable. Nevertheless, mitigation measures will be implemented to minimise impacts of the Project on the lagoon during the construction phase of the Project as discussed in ***Section 9.7.4***. This includes avoiding laydown and stockpile areas directly adjacent to the lagoon and the implementation of sediment and runoff controls. As such, impacts on water quality within the lagoon are expected to be short term.

8.3.5. Vehicle Strikes

The operational and construction phases of the Project will involve the movement of vehicles. However, the anticipated vehicle movement is not anticipated to be significantly greater than current conditions. Vehicle movements are expected to be very slow, mostly limited to forklift activity, public access to the boat ramp and waste drop off/management. While speed limits on Lord Howe Island don't exceed 25km/hr, additional speed

limits will be identified for vehicles entering the site to minimise potential vehicle strikes and for personal safety. Furthermore, wildlife signs (i.e. Lord Howe Island Woodhen and Wedge-tailed Shearwater) will be installed to ensure motorists are aware of fauna that may cross roads and hardstand areas.

8.4. Summary

Table 10 summarises the measures to avoid and minimise impacts of the Project.

Table 10 Summary table of options considered for the Project to avoid and minimise impacts on biodiversity

Action	Adopted (Yes/No/In part)	Justification	Timing (if adopted)	Responsibility (if adopted)	Outcome (if adopted)
Implementation of a suite of mitigation measures	Yes	To minimise the impacts on biodiversity, a suite of mitigation measures will be implemented such as delineation of clearing areas, timing of clearing, pre-clearance measures, fauna translocation, clearance supervision, fauna handling protocols, weed management, landscaping/revegetation and erosion, sedimentation and pollution controls.	Pre and post construction and during operation phase	Proponent and consultant team	Minimise impacts on biodiversity
Locating the Project predominantly within areas containing exotic-dominated vegetation which has previously been cleared	In part	The Project has been located in an area where the majority of vegetation to be impacted comprises previously cleared land, exotic vegetation and small areas of remnant native vegetation. Given the Project requirements, not all native vegetation and associated habitat could be retained.	Project planning	Proponent and consultant team	Impacts predominantly occur in areas of low biodiversity value.
Partial development of the study area to avoid/minimise impacts on biodiversity	No	The development cannot be reduced in scale to avoid/minimise impacts on biodiversity due to the highly specific design requirements of the Project.	-	-	-

Action	Adopted (Yes/No/In part)	Justification	Timing (if adopted)	Responsibility (if adopted)	Outcome (if adopted)
'Do-nothing' option to avoid all impacts on biodiversity	No	The do-nothing option for the Project is not feasible. The Project is for Critical State Significant Infrastructure upgrades to service the needs of the community (including tourism) on Lord Howe Island.	-	-	-
Consideration of alternative sites and layouts for the Project within the study area	Yes	Alternative sites were considered for the Project. Initial design iterations had considered locating the entire Project in the South Zone, however, impacts on both terrestrial and aquatic biodiversity values were deemed to be unacceptable. Other locations on the island were also considered during early project planning, however, were subsequently removed from consideration following the completion of detailed technical studies and subsequent community consultation.	-	-	-

9. Impact Assessment

This chapter discusses the potential impacts of the Project on the biodiversity values of the subject land. Both direct and indirect impacts have been considered in the impact assessment, with direct impacts being primarily related to vegetation and habitat removal and indirect impacts relating to habitat fragmentation and edge effects resulting from such impacts. Prescribed impacts, although not considered separately, are mainly covered by the sections on direct impacts as detailed below.

Impacts to TECs, threatened and migratory species listed under the BC Act and/or EPBC Act are assessed in the FFA in Appendix A, however they have also been reproduced in the following sections.

9.1. Direct Impacts

9.1.1. Vegetation Removal

The largest direct impact of the Project is the removal of vegetation and associated habitat within the subject land. Although there are different types of flora and fauna habitat within the subject land such as water within the lagoon, ground litter and rocks, the most extensive habitat to be impacted is represented by vegetation. Vegetation subject to direct impacts is shown in Figure 16.

The subject land has been subject to historic disturbance and modification since human settlement, and as such the vegetation to be removed comprises small areas of remnant lowland native vegetation, environmental plantings, native plantations and exotic vegetation. Areas of vegetation communities to be removed within the subject land are provided in **Table 11**. These impacts include the removal of 0.75 ha of native vegetation, including 0.70 ha of native vegetation communities, 0.002 ha of environmental plantings, and 0.05 ha of native plantations. Larger areas of each of the native vegetation impacted within the subject land will be retained within the study area as shown in **Table 11**.

It is noted that within the South Zone, the subject land includes areas mapped as native vegetation along the existing access roads. These areas comprise overhanging canopy from trees along the existing access roads. No works are proposed to be undertaken along the existing access roads, which will only be used in its current condition if required to transport equipment.

While the Project has largely been situated within previously cleared areas, the disturbance footprint has included areas of native vegetation within the South Zone that require remediation due to contamination. These areas are only proposed to be impacted because of the remediation and not required for the construction and operation of the WMF.

The native vegetation communities to be removed for the Project are well represented on Lord Howe Island, and minor impacts associated with the proposed development are not considered to significantly alter the composition and distribution of these communities on Lord Howe Island. Furthermore, none of the native vegetation to be removed within the subject land conforms to a TEC under the BC Act or EPBC Act.

Mitigation measures to address the loss of vegetation and associated habitat are addressed in **Chapter 10**.

Table 11 Vegetation communities removed within the subject land and retained within the study area

Community #	Vegetation Community	BC Act Status	EPBC Act Status	Removed within the Subject Land (ha)			Retained within the Study Area		
				North Zone	South Zone[2]	Sub Total	North Zone	South Zone	Sub Total
Native Vegetation									
1	Coastal Spinifex - Dune Bean - Club Rush - Melanthera biflora - Saltwater Couch beach strandline grassland	-	-	0.00	0.26	0.26	0.00	1.06	1.06
2	Melanthera biflora – Saltwater Couch herbland/grassland on coral boulder beaches and rocky headlands	-	-	0.01	0.00	0.01	0.23	0.00	0.23
6	Sallywood swamp forest of poorly drained, low-lying areas	CEEC	CEEC	0.00	0.00	0.00	0.00	0.03	0.03
8	Bully Bush - Hopwood shrubland on shallow rocky soils	-	-	0.04	0.06	0.10	0.14	0.58	0.72
12a	Kentia Palm Forest on coral sand and calcarenite	-	-	0.01	0.17	0.18	0.05	0.97	1.02
12b	Banyan - Kentia Palm forest on coral sand and calcarenite	-	-	0.00	0.00	0.00	0.14	0.00	0.14
12a/Ex	Kentia Palm Forest on coral sand and calcarenite with emergent *Araucaria heterophylla*	-	-	0.02	0.00	0.02	0.23	0.00	0.23
17a	Greybark - Blackbutt rainforest	-	-	0.00	0.13	0.13	0.00	1.67	1.67
17b	Greybark - Blackbutt low closed forest on exposed basalt slopes	-	-	0.00	0.00	0.00	0.00	0.01	0.01
21	River Mangrove tall shrubland of brackish creeks	-	-	0.00	0.00	0.00	0.00	0.06	0.06
Ep	Environmental plantings	-	-	0.00	0.002	0.00	0.00	0.43	0.43
Np	Plantation	-	-	0.05	0.00	0.05	0.20	0.13	0.34
Subtotal[1]				**0.14**	**0.61**	**0.75**	**0.99**	**4.94**	**5.93**

Community #	Vegetation Community	BC Act Status	EPBC Act Status	Removed within the Subject Land (ha)			Retained within the Study Area		
				North Zone	South Zone[2]	Sub Total	North Zone	South Zone	Sub Total
Other Vegetation									
Ex	Exotic Vegetation	-	-	0.33	1.48	1.81	0.16	5.62	5.79
Beach	Sand/Boulder Beach	-	-	0.34	0.01	0.34	0.79	1.06	1.85
Cl	Cleared land	-	-	0.38	1.08	1.46	0.10	0.66	0.76
Water	Water	-	-	0.89	0.00	0.89	0.11	0.00	0.11
Subtotal[1]				**1.94**	**2.57**	**4.51**	**1.17**	**7.34**	**8.51**
Total[1]				**2.08**	**3.18**	**5.26**	**2.16**	**12.28**	**14.44**

1. In some cases totals may not add up due to rounding

The vegetation within the North Zone has been subject to historical disturbance. Aerial imagery from 2006 shows that there was minimal vegetation along the seawall and banks of the lagoon both to the north and south of the existing jetty, which is expected given these areas would have been completely cleared to construct the sea wall (see Figure 17). The vegetation along the banks appears to be limited to shrubs planted in a defined row along the top of the bank as well as plantings of Kentia Palms in rows within grassland areas adjacent to Lagoon Road, south of the existing jetty. Today, the banks consist of dense shrubs that conform to Bully Bush – Hopwood shrubland (Community 8), with a narrow strip of Melanthera biflora – Saltwater Couch herbland/grassland on coral boulder beaches and rocky headlands (Community 2) along the western edge. Furthermore, planted Kentia Palms are now established within mown areas of exotic grassland.

The South Zone has also been subject to historical disturbance. Access roads including Old Lagoon Road have been maintained within the subject land as well as access into the WMF and several tracks down onto Lagoon Beach. Aerial imagery from 2006 shows the extent of previous disturbance within and around the WMF, particularly along the coast between Cobbys Creek to the south and the boundary of the airport in the north (see Figure 18). It is expected that native grasslands (Community 1) along the beach strandline have persisted despite historical disturbance, although the invasion of exotic grasses as a result of disturbance is evident today. The large patches of rainforest vegetation within the South Zone have remained relatively consistent in distribution. Smaller patches of rainforest vegetation on the southern side of the WMF and in the south near Lagoon Road, which appear to have existed as predominantly shrubby vegetation since 2006, have regenerated into intact rainforest vegetation today, although these patches are small and linear, and are degraded as a result of edge effects and continued disturbance from the operation of the WMF. In the 2006 aerial imagery, previously disturbed areas along the lagoon appear to be comprised predominantly of grassland vegetation with scattered shrubs. Today, these areas have naturally regenerated into dense shrubland vegetation that conforms to Bully Bush – Hopwood shrubland (Community 8).

While aerial imagery from 2006 and earlier can be hard to determine exactly how much vegetation within the study area comprises remnant native vegetation, evidence suggests that almost all of the vegetation within the subject land has been subject to historic disturbance and is largely comprised of planted and regrowth vegetation that has matured and is now consistent with the occurrence of native vegetation communities on Lord Howe Island as described in the 2016 floristic study (Sheringham et al., 2016).

9.1.2. Loss of Specific Habitat Features

In addition to the clearance of broad habitats, the Project will include the removal of specific habitat features within the subject land. Specific fauna habitat features that will be removed by the Project include:

- Blossom-producing trees and shrubs suitable as foraging for a range of frugivores, nectarivores and insectivores;
- Shrubby understorey vegetation that offers shelter and foraging habitat for small birds; and
- Ground covers including dense leaf litter and rocks that provide shelter and foraging resources for reptiles and invertebrates.

The removal of these habitat features also has the potential to directly impact the fauna species utilising the habitats during the clearing process. Although birds are highly mobile species and likely to self-relocate during this period, there is potential for fauna to remain within the habitat features, such as under rocks and within dense leaf litter. As such, species with a higher potential to be impacted during the clearing process include the less mobile species such as the Lord Howe Island Skink, Lord Howe Island Gecko and the Lord Howe Placostylus. There is potential for injury and mortality during the clearing process to these individuals if present within the clearing areas. If the mitigation measures outlined in **Chapter 10** are implemented, these impacts can be avoided or minimised. Further assessment on the impacts of the Project on threatened and migratory species is provided in ***Section 9.4*** and ***Section 9.5***.

Despite the Project resulting in the removal of habitat and specific habitat features, extensive areas of land containing similar habitat occurs within the study area and surrounds. It is anticipated that the types of flora and fauna species utilising the habitat within the subject land will continue to persist within other areas of the study area where suitable habitat is present.

9.2. Impacts on Threatened Ecological Communities

One TEC has been identified within the study area however it is not located within the subject land. The TEC is located in the southern portion of the South Zone along Cobbys Creek. No works are proposed to be undertaken in the vicinity of the TEC and therefore the Project is unlikely to impact upon the TEC.

9.3. Impacts on Threatened Flora Species

Two threatened flora species, Knicker Nut (*Caesalpinia bonduc*) and Sand Spurge (*Chamaesyce psammogeton*) were considered to have a moderate potential to occur within the subject land (see **Appendix A**), however neither species was recorded during targeted surveys. Furthermore, no other threatened flora species listed under the BC Act were recorded within the subject land or wider study area. As such, no significant impacts are predicted to occur to threatened flora species as a result of the Project.

9.4. Impacts on Threatened Fauna Species

The Project will result in the removal of suitable foraging and/or breeding habitat for threatened fauna species known to occur within the subject land. Seven threatened fauna species have been recorded within the subject land during field surveys, all of which are birds that are highly mobile species capable of accessing habitat throughout the study area and wider locality.,

A further six threatened species listed under the BC Act and/or EPBC Act have been recorded within the study area, and despite not being recorded within the subject land, are considered to have the potential to occur. This includes three birds, the Ruddy Turnstone (*Arenaria interpres*), Bar-tailed Godwit (*Limosa lapponica baueri*) and Masked Booby (*Sula dactylatra*), two reptiles, the Lord Howe Island Skink (*Oligosoma lichenigera*) and Lord Howe Island Gecko (*Christinus guentheri*) and one invertebrate, the Lord Howe Placostylus (*Placostylus bivaricosus*). Although these species were not recorded within the subject land, suitable habitat is considered to occur.

Further details on the impacts to habitat for the threatened species known or potentially occurring within the subject land are provided in the following sections, whilst a table summarising the total area of habitat to be removed within the subject land is provided in Table 12.

9.4.1. Known Threatened Species

Of the threatened birds recorded within the subject land, the Sooty Tern (*Onychoprion fuscata*) and Black-winged Petrel (*Pterodroma nigripennis*) were both recorded aerially above the subject land, in transit between foraging sites. Habitat for these two species is limited to a very small area of foraging habitat (approximately 0.89 ha) within the lagoon adjacent to the existing jetty. The Sooty Tern is also known to roost on beaches, however the species was not recorded roosting within the subject land and given the species have known roosting/breeding sites at Ned's Beach and Blinkys Beach on the eastern side of the island, the small area of beach within the subject land is not considered to be used as roosting habitat. Potential habitat for these species may be reduced marginally, however these impacts are largely restricted to short-term impacts during construction of the marine infrastructure and foraging habitat within the lagoon will be available in the long term. Maps identifying suitable habitat for the Sooty Tern and Black-winged Petrel within the study area are provided in the FFA in **Appendix A**.

The remaining threatened birds known to occur include the White Tern (*Gygis alba*), Lord Howe Woodhen (*Hypotaenidia sylvestris*), Golden Whistler (Lord Howe Is. subsp.) (*Pachycephala pectoralis contempta*) Pied Currawong (Lord Howe Is. subsp.) (*Strepera graculina crissalis*) and Silvereye (Lord Howe Is. subsp.) (*Zosterops lateralis tephropleurus*).

Approximately 0.21 ha of suitable roosting and breeding habitat (comprising five Norfolk Island Pine trees) and 0.89 ha of suitable foraging habitat is available within the subject land, all of which is located within the North Zone. A map identifying suitable habitat for the White Tern within the wider study area is provided in the FFA in **Appendix A**. While the Norfolk Island Pine trees are an introduced tree species on the island, White Terns predominantly use the Norfolk Island Pines for roosting and breeding. While one Norfolk Island Pine tree will be removed within the subject land comprising approximately 0.01 ha, a further four Norfolk Island Pine Trees covering 0.20 ha will be retained within the subject land which will continue to provide suitable roosting and breeding habitat for the White Tern. Within the North Zone, the White Tern was only recorded within the Norfolk Island Pine trees, however, the species also utilises bare branches on other trees and shrubs for breeding. The Project has been designed to avoid native vegetation to the largest extent possible and therefore large areas of suitable roosting and breeding habitat have been retained within the study area. Furthermore, large areas of suitable habitat including a significant number of Norfolk Island Pine trees are available beyond the study area in close proximity to the lagoon which are also known to be used by the White Tern for roosting and breeding. Given the large areas of available habitat retained within the subject land, study area and wider locality, the removal of one Norfolk Island Pine tree is not considered to have a significant impact on the White Tern. The White Tern has not been observed foraging within the subject land, however approximately 0.89 ha of water in the North Zone within the lagoon provide potential foraging habitat. Impacts to foraging habitat will be predominantly short term, limited to the construction phase of the Project and given the large areas of suitable foraging habitat within the locality, the Project is not considered to have a significant impact on foraging habitat for the White Tern.

Approximately 2.57 ha of known foraging and breeding habitat will be removed within the subject land for the Lord Howe Island Woodhen. A map identifying suitable habitat for the Lord Howe Island Woodhen within the subject land and study area is provided in the FFA in **Appendix A**. This includes 0.75 ha of native vegetation and 1.81 ha of exotic vegetation. While 2.57 ha of suitable habitat will be removed within the subject land, 11.72 ha will remain within the study area. Furthermore, landscaping is proposed to be undertaken within the subject land to ensure there is no net loss of native vegetation that provides suitable habitat for the species. The Lord Howe Woodhen has also been recorded using cleared areas such as roads and laydown areas which have not been considered within this assessment. The Lord Howe Island Woodhen has become highly abundant across the island due to the successful captive breeding program as well as the eradication of the Black Rat (*Rattus rattus*) with nearly 6,000 records of the species in the locality held within the NSW BioNet. The species was regularly observed foraging and roosting within the subject land as well as modified urban habitats around the community including sporting fields, garden beds and the golf course. Records of the species occurring across most vegetation communities across the island and therefore the small area of habitat to be removed within the subject land is unlikely to have a significant impact on the species given the large areas of suitable habitat available in the study area and wider assessment area.

The Golden Whistler (Lord Howe Is. subsp.), Pied Currawong (Lord Howe Is. subsp.) and Silvereye (Lord Howe Is. subsp.) are all woodland birds that are known to occur within the subject land. Approximately 0.65ha of native vegetation that provides suitable habitat for these species will be removed from the subject land. A map identifying suitable habitat for the Golden Whistler (Lord Howe Is. subsp.), Pied Currawong (Lord Howe Is. subsp.) and Silvereye (Lord Howe Is. subsp.) within the subject land and study area is provided in the FFA in **Appendix A**. These species are all highly mobile and are unlikely to rely solely on the habitat within the subject land. While there will be a small area (0.65 ha) of suitable habitat removed within the subject land, larger areas are available within the study area (4.71 ha) and wider assessment area which will be managed and protected in the long term.

Formal Tests of Significance under Section 7.3 of the BC Act have been prepared for the seven threatened fauna species known to occur based on the presence of suitable habitat and are included within the FFA in **Appendix A**. The Tests of Significance indicate that the Project is unlikely to result in a significant impact on any of the known threatened fauna species.

9.4.2. Potentially Occurring Threatened Species

Ruddy Turnstone (*Arenaria interpres*) and Bar-tailed Godwit (*Limosa lapponica baueri*) were both recorded within the study area. Both species were only recorded within the South Zone, foraging within tidal areas of the beach. While the Ruddy Turnstone was recorded along the beach in both the northern and southern portions of the South Zone, the Bar-tailed Godwit was only recorded in the southern portion around Cobbys Creek. Both species were recorded on multiple occasions, however the species was only recorded within the tidal areas of the beach. Within the South Zone, the subject land does not include any section of beach and therefore no suitable habitat is available for the species within the subject land in the South Zone. While these two species were not observed within the North Zone, the subject land does include a small section of beach habitat within the tidal zone that offers potential foraging habitat (approximately 0.34 ha) for these two species. Despite the potential habitat available, the NSW BioNet Atlas only holds records of the Ruddy Turnstone within the subject land and wider North Zone study area.

Potential habitat for these species may be reduced marginally, however these impacts are largely restricted to short-term impacts during construction of the marine infrastructure and foraging habitat along the beach will be available in the long term. A map identifying suitable habitat for the Ruddy Turnstone and Bar-tailed Godwit within the subject land and study area is provided in the FFA in **Appendix A**.

The Masked Booby (*Sula dactylatra*) was recorded flying aerially across the study area within the South Zone. One individual bird was observed flying predominantly along the edge of the lagoon and over the beach, repeatedly flying back and forth appearing to be foraging over the shallow waters of the lagoon. However, no suitable foraging habitat is available within the South Zone. A small area (0.89 ha) of foraging habitat is available within the North Zone. This is limited to the areas of the lagoon that are within the subject land around the existing jetty. While these areas offer habitat for suitable prey species, they are located in close proximity to the jetty which is a highly disturbed area and is unlikely to be used by the species for foraging. Nevertheless, on a precautionary approach, the small area of the lagoon within the North Zone has been identified as suitable habitat for the species. The removal of 0.89 ha of potential, albeit marginal foraging habitat is unlikely to have a significant impact on the species in the short or long term, especially given the species is a marine pelagic species that typically feeds at sea. Roosting and breeding sites for the Masked Booby are well studied on Lord Howe Island, and are not located within the subject land or wider study area. Despite the small area of potential foraging habitat, the occurrence of the species within the subject land and wider study area is likely limited to aerial records when the species is in transit between roosting/breeding sites and foraging sites. As such, the Project is not considered to have a significant impact on the Masked Booby. A map identifying suitable habitat for the Masked Booby within the subject land and study area is provided in the FFA in **Appendix A**.

The Lord Howe Island Skink and Lord Howe Island Gecko were not recorded within the subject land, however, were recorded in areas immediately adjacent to the subject land and are considered to have the potential to occur. Despite not being present within the subject land or study area, potential habitat is available. Approximately 6.73 ha of suitable habitat is available within the study area, with approximately 0.80 ha proposed to be removed within the subject land. Habitat mapped for these species has included grassy and shrubby communities on the beach margin which is described as potential habitat for both species in the Lord Howe Island Biodiversity Management Plan. However, records of the species during field surveys suggest that they favour closed forests with higher levels of litter, calcarenite outcropping and an abundance of trees/palms, which have largely been avoided through the design of the Project. The habitat to be removed within the subject land is located on predominantly coral sandy soils and calcarenite rock is absent, with the exception of areas along the beach which are tidal. Furthermore, these areas have generally low litter cover and therefore are not considered to provide optimal shelter habitat for these two reptile species. Nevertheless, a precautionary approach has been taken to identify potential habitat for these species and therefore all areas of native vegetation within the subject land have been considered as potential habitat. A map identifying suitable habitat within the subject land and study area is provided in the FFA in **Appendix A**.

Approximately 0.42 ha of potential habitat for the Lord Howe Placostylus will be removed within the subject land. A map identifying suitable habitat within the subject land and study area for the Lord Howe Placostylus is provided in the FFA in **Appendix A**. This includes all areas of native vegetation that comprises dense litter cover. As well as a high numbers of empty shells. However, no live snails were recorded within the subject land.

Furthermore, the subject land is not located within the species known area of occupancy. The Lord Howe Placostylus is not highly mobile however known populations occur within the study area in both the North and South Zones. Within the North Zone, the Project may potentially reduce the extent of habitat available for the species, however it is not likely to fragment the existing population into two or more populations as the disturbance occurs beyond the known area of occupancy. Within the South Zone, the species has been recorded in two general locations. One along the existing access road to the north, and one in the central portion of the study area slightly east of the existing waste facility access gate. Given the species is not highly mobile, and the occurrences of the species within the South Zone are approximately 220 m apart, they have been considered as separate populations. The subject land is located outside of the known area of occupancy for the two populations within the South Zone and therefore the Project is not considered to remove known habitat for the species within the South Zone. Furthermore, the Project is unlikely to fragment the population in the central portion of the South Zone as impacts are located outside of the known area of occupancy. Overall, the extent of suitable habitat available to the population may be reduced, however the known area of occupancy will not be reduced.

Large areas of suitable habitat to remain undisturbed within the study area, both within the North Zone and South Zone, have large quantities of old, empty Lord Howe Placostylus shells, suggesting these areas comprise suitable habitat and would have been occupied by the species prior to the invasion of Black Rat. Therefore, large areas of suitable habitat will be retained within the study area.

Formal Tests of Significance in accordance with Section 7.3 of the BC Act have been prepared for the six threatened fauna species considered likely to occur, based on nearby records and presence of suitable habitat, and are included within the FFA in **Appendix A**. The Tests of Significance indicate that the Project is unlikely to result in a significant impact on any of the potentially occurring threatened fauna species.

Table 12 Summary of habitat for known and potentially occurring threatened species within the study area and subject land

Common Name	Scientific Name	Occurrence Summary	Habitat Type	Study Area			Subject Land		
				North Zone	South Zone	Total	North Zone	South Zone	Total
Birds									
White Tern	*Gygis alba*	Known	Foraging Habitat	1.02	0.00	1.02	0.89	0.00	0.89
			Roosting/Breeding Habitat	0.52	0.00	0.52	0.21	0.00	0.24
Lord Howe Woodhen	*Hypotaenidia sylvestris*	Known	Foraging/Roosting/Breeding Habitat	1.63	12.65	14.29	0.47	2.09	3.27
Sooty Tern	*Onychoprion fuscata*	Known	Foraging/Roosting/Breeding Habitat	1.00	0.00	1.00	0.89	0.00	0.89
Black-winged Petrel	*Pterodroma nigripennis*	Known	Foraging/Roosting/Breeding Habitat	1.00	0.00	1.00	0.89	0.00	0.89
Golden Whistler (Lord Howe Is. subsp.)	*Pachycephala pectoralis contempta*	Known	Foraging/Roosting/Breeding Habitat	1.06	4.31	5.36	0.26	0.39	1.21
Pied Currawong (Lord Howe Is. subsp.)	*Strepera graculina crissalis*	Known	Foraging/Roosting/Breeding Habitat	1.06	4.31	5.36	0.26	0.39	1.21
Silvereye (Lord Howe Is. subsp.)	*Zosterops lateralis tephropleurus*	Known	Foraging/Roosting/Breeding Habitat	1.06	4.31	5.36	0.26	0.39	1.21
Ruddy Turnstone	*Arenaria interpres*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34
Bar-tailed Godwit	*Limosa lapponica baueri*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34
Masked Booby	*Sula dactylatra*	Potential	Foraging Habitat	1.02	0.00	1.02	0.89	0.00	0.89
Reptiles									
Lord Howe Island Skink	*Oligosoma lichenigera*	Potential	Foraging/Roosting/Breeding Habitat	1.18	5.55	6.73	0.18	0.61	0.80
Lord Howe Island Gecko	*Christinus guentheri*	Potential	Foraging/Roosting/Breeding Habitat	1.18	5.55	6.73	0.18	0.61	0.80

Common Name	Scientific Name	Occurrence Summary	Habitat Type	Study Area			Subject Land		
				North Zone	South Zone	Total	North Zone	South Zone	Total
Invertebrates (Molluscs)									
Lord Howe Placostylus	*Placostylus bivaricosus*	Potential	Foraging/Roosting/Breeding Habitat	0.88	3.03	3.91	0.12	0.30	0.42

9.5. Impact on Migratory Fauna Species

The Project will result in the removal of known roosting and breeding habitat for one migratory species, the Wedge-tailed Shearwater (*Ardenna pacifica*). The Wedge-tailed Shearwater was the only migratory species recorded within the subject land, however a further 26 migratory species are considered to have the potential to occur as identified in the likelihood of occurrence table in the FFA provided in **Appendix A**. Of the, potentially occurring migratory species, only eight species were recorded within the study area during targeted surveys. These species are considered to be the most likely to occur and have been discussed as potentially occurring migratory species in ***Section 9.5.2***. These are all highly mobile species capable of accessing habitat throughout the study area and wider locality. Further details on the impacts to habitat for the migratory species recorded within the subject land and study area are provided below, whilst a table summarising the total area of habitat to be removed within the subject land is provided in **Table 13**. Additional assessment of known and potentially occurring migratory species is provided in **Appendix B**.

9.5.1. Known Migratory Species

Approximately 0.06 ha of known roosting and breeding habitat will be removed within the subject land for the Wedge-tailed Shearwater. This includes approximately 0.04 ha of native vegetation and 0.02 ha of exotic vegetation all within the North Zone along the banks of the lagoon on either side of the existing wharf. While the species was also recorded within the South Zone, this was a flyover record and the species is not known to utilise potential habitat available within the South Zone. A map identifying suitable habitat within the subject land and study area for the Wedge-tailed Shearwater is provided in the FFA in **Appendix A**.

Within the North Zone the species was observed during surveys roosting in areas of exotic grassland, including mown lawns, as well as within cleared areas and on the road. While cleared areas which include existing roads are used by the species for roosting, these areas are not considered as suitable habitat for the species within this assessment. Given the species uses a variety of habitats for roosting (i.e. cleared land, exotic grassland, native vegetation), the small area of habitat to be removed is unlikely to significantly impact the roosting habits of the species. Furthermore, as identified in the Project's Landscape and Urban Design Plans, areas of exotic grassland will be re-established adjacent to the jetty following construction of the Project which will continue to provide roosting habitat for the species in the long-term.

The North Zone also provides known breeding habitat for the species with burrows excavated within unmanaged exotic grassland and native vegetation along the banks of the lagoon. The Wedge-tailed Shearwater is a migratory marine species that arrives on Lord Howe Island from early August to early September. They will generally lay eggs from late November to early December, with birds fledging by late April to early May. A stretch of approximately 260 m along the banks of the North Zone is used by the species for breeding, of which up to approximately 60 m may be removed within the subject land immediately adjacent to the existing wharf. This, however, includes all areas subject to disturbance for construction of the Project, with the majority of exotic grassland within the subject land proposed to be re-established which will continue to provide breeding habitat for the species in the long term. Provided works are undertaken outside of the key breeding periods when the species is not present (or in very low numbers) on the island, then impacts to the species will be limited to the reduction of a small area of breeding habitat. Overall, breeding habitat for the

species will be slightly reduced, however large areas of suitable breeding habitat will be retained within the study area.

9.5.2. Potentially Occurring Migratory Species

Three of the migratory species recorded within the study area and considered to have potential to occur within the subject land are also listed as threatened species and have been assessed in ***Section 9.4***. This includes the Bar-tailed Godwit, Ruddy Turnstone and Masked Booby. The Project is not considered to have a significant impact on these three potentially occurring migratory species.

The Common Noddy was only recorded within the study area in the South Zone. The species was recorded flying along the edge of the beach and over the lagoon. The subject land does not provide suitable roosting/breeding habitat in the form of rocky islets and stacks with precipitous cliffs. While the species may roost on beaches, the subject land comprises a very small area of beach habitat that is tidal and not considered to be preferred roosting habitat. As such, suitable habitat for the species is limited to a very small area of foraging habitat (approximately 0.89 ha) within the lagoon adjacent to the existing jetty. A map identifying suitable habitat within the subject land and study area for the Common Noddy is provided in the FFA in **Appendix A**. Potential habitat for the species may be reduced marginally, however these impacts are largely restricted to short-term impacts during construction of the marine infrastructure and foraging habitat within the lagoon will be available in the long-term. Furthermore, significantly larger areas of more suitable habitat are available within the study area and wider locality.

The Wandering Tattler was only recorded within the study area in the North Zone. The species was recorded roosting on an exposed rock platform within the lagoon. Suitable habitat for the species is limited within the subject land to a small area of beach habitat around the existing jetty in the North Zone (approximately 0.34 ha) which provides roosting and foraging resources. While the species may roost on beaches, the subject land comprises a very small area of beach habitat that is tidal and not considered to be preferred roosting habitat, particularly given absence of records of the species in these areas. As such, suitable habitat for the species is limited to a very small area of foraging habitat (approximately 0.34 ha) along the beach beside the existing jetty. A map identifying suitable habitat within the subject land and study area for the Wandering Tattler is provided in the FFA in **Appendix A**. Potential habitat for the species may be reduced marginally, however these impacts are largely restricted to short-term impacts during construction of the marine infrastructure and foraging habitat within the lagoon will be available in the long-term with only a reduction of approximately 0.02 ha of habitat which will form part of the piled vessel ramp. Furthermore, significantly larger areas of more suitable habitat are available within the study area and wider locality.

The Double-banded Plover and Whimbrel were only recorded within the South Zone. These species were recorded roosting/foraging along the beach in the South Zone and were not recorded within the subject land. Although not recorded in the North Zone, suitable habitat for the species within the subject land is limited to a small area of beach habitat around the existing jetty (approximately 0.34 ha) which provides roosting and foraging habitat. While the species may roost on beaches, the subject land comprises a very small area of beach habitat that is tidal and not considered to be preferred roosting habitat, particularly given absence of records of the species in these areas. As such, suitable habitat for the species is limited to a very small area of foraging habitat (approximately 0.34 ha) along the beach beside the existing jetty. A map identifying suitable habitat

within the subject land and study area for the Double-banded Plover and Whimbrel are provided in the FFA in **Appendix A**. Potential habitat for these species may be reduced marginally, however these impacts are largely restricted to short-term impacts during construction of the marine infrastructure and foraging habitat within the lagoon will be available in the long-term with only a reduction of approximately 0.02 ha of habitat which will form part of the piled vessel ramp. Furthermore, significantly larger areas of more suitable habitat are available within the study area and wider locality.

The Pacific Golden Plover was recorded within the study area on the exposed rocky platforms in the lagoon in the North Zone and along the beach within the South Zone. No individuals were recorded within the subject land. Suitable roosting and foraging habitat within the subject land is restricted to the small area of beach habitat around the existing jetty in the North Zone (approximately 0.34 ha), which provides potential roosting and foraging habitat. As such, suitable habitat for the species is limited to a very small area of foraging habitat (approximately 0.34 ha) along the beach beside the existing jetty. A map identifying suitable habitat within the subject land and study area for the Pacific Golden Plover is provided in the FFA in **Appendix A**. Potential habitat for the species may be reduced marginally, however these impacts are largely restricted to short-term impacts during construction of the marine infrastructure and foraging habitat within the lagoon will be available in the long-term with only a reduction of approximately 0.02 ha of habitat which will form part of the piled vessel ramp. Furthermore, significantly larger areas of more suitable habitat are available within the study area and wider locality.

Table 13 Summary of habitat for known and potentially occurring migratory species identified within the study area and subject land

Common Name	Scientific Name	Occurrence Summary	Habitat Type	Study Area			Subject Land		
				North Zone	South Zone	Total	North Zone	South Zone	Total
Birds									
Wedge-tailed Shearwater	*Ardenna pacifica*	Known	Roosting and Breeding Habitat	0.43	0.00	0.43	0.06	0.00	0.06
Ruddy Turnstone	*Arenaria interpres*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34
Bar-tailed Godwit	*Limosa lapponica baueri*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34
Masked Booby	*Sula dactylatra*	Potential	Foraging Habitat	1.00	0.00	1.00	0.89	0.00	0.89
Common Noddy	*Anous stolidus*	Potential	Foraging Habitat	1.00	0.00	1.00	0.89	0.00	0.89
Wandering Tattler	*Tringa incana*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34
Double-banded Plover	*Charadrius bicinctus*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34
Pacific Golden Plover	*Pluvialis fulva*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34
Whimbrel	*Numenius phaeopus*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34

9.6. Indirect Impacts

Potential indirect impacts arising from the Project are outlined in Table 14. Indirect impacts have been developed based on a number of factors, including:

- Presence of native vegetation and habitats directly adjacent to the subject land, and the potential for surrounding vegetation and habitat to be negatively affected by the Project; and
- Landscape scale impacts to habitat connectivity.

No indirect impact zones have been identified for the purpose of this assessment.

Table 14 Indirect impacts of the Project

Indirect Impact	Nature	Extent	Duration	Threatened Entities Likely Affected	Consequences
Inadvertent impacts on adjacent habitat or vegetation	Construction activities may result in inadvertent impacts on retained vegetation outside the subject land, such as increased sedimentation.	Retained native vegetation outside the subject land	Short term (during construction)	Threatened/migratory birds, threatened reptiles and Lord Howe Placostylus	Reduced condition of retained native vegetation outside the subject land.
Reduced viability of adjacent habitat due to edge effects	Removal of vegetation within the subject land may increase edge effects in the retained vegetation to the west.	Retained native vegetation outside the subject land	Potential long-term	Threatened/migratory birds, threatened reptiles and Lord Howe Placostylus	Reduced condition of retained native vegetation outside the subject land.
Reduced viability of adjacent habitat due to noise, dust or light spill	The construction and operation activities associated with the Project are likely to increase the noise, dust and light above current levels within the subject land which may impact adjacent retained native vegetation.	Retained native vegetation outside the subject land	Short term (during construction)	Threatened/migratory birds, threatened reptiles and Lord Howe Placostylus	Disruption of fauna habitat usage during construction and operation of the marine and wastewater facilities.
Transport of weeds and pathogens from the subject site to adjacent vegetation	A number of exotic weeds are known to occur within the subject land and may be inadvertently spread to retained native vegetation outside the subject land.	Retained native vegetation outside the subject land	Potential long-term	Threatened/migratory birds, threatened reptiles and Lord Howe Placostylus	Reduced condition of native vegetation and habitat surrounding the subject land.
Increased risk of starvation, exposure and loss of shade or shelter	Some potential foraging and shelter habitat will be removed from the subject land due to the removal of native vegetation and human-made	Native vegetation and human-made structures within the subject land	Short term (during construction)	Threatened/migratory birds, threatened reptiles and Lord Howe Placostylus	Reduction in foraging resources, predominantly of highly mobile fauna species,

Indirect Impact	Nature	Extent	Duration	Threatened Entities Likely Affected	Consequences
	structures. Revegetation will be undertaken to minimise these impacts in the long term.				and loss of shelter habitat.
Loss of breeding habitat	The Project will result in the removal of shrubby native vegetation as well as one Norfolk Island Pine tree that provides potential breeding habitat.	Native vegetation within the subject land	Long-term	Threatened and migratory birds including the Lord Howe Woodhen, White Tern and Wedge-tailed Shearwater	Reduction in available breeding habitat and increased competition for suitable breeding habitat retained within the subject land and outside of the subject land.
Trampling of threatened flora	Not applicable. No threatened flora species recorded within the subject land.	-	-	-	-
Inhibition of nitrogen fixation and increased soil salinity	Impact unlikely. Indirect impacts associated with nitrogen fixation and increased soil salinity are considered to be negligible.	-	-	-	-
Fertiliser drift	Impact unlikely. The Project does not propose the use of fertilisers	-	-	-	-
Wood collection	Impact unlikely. The Project will not facilitate wood collection.	-	-	-	-
Removal and disturbance of rocks, including bush rock	The Project may result in the removal of some calcarenite rock as well as	Native and exotic vegetation along the western boundary of	Long-term	Threatened Reptiles	Reduction in available shelter habitat within the subject land.

Indirect Impact	Nature	Extent	Duration	Threatened Entities Likely Affected	Consequences
	rocks currently installed within the break wall in the North Zone.	the North Zone, predominantly around the existing jetty			
Increase in predatory species populations	Impact unlikely. The Project is located predominantly within previously cleared areas. Furthermore, the infrastructure facilities proposed to be constructed for the Project are unlikely to increase predatory species populations.	-	-	-	-
Increase in pest animal populations	Impact unlikely. Strict biosecurity measures are implemented on the island to prevent the introduction of pest animals.	-	-	-	-
Increased risk of fire	Impact unlikely. The Project is unlikely to increase the risk of bushfire.	-	-	-	-
Disturbance to specialist breeding and foraging habitat	One Norfolk Island Pine tree is proposed to be removed within the North Zone which provides breeding habitat for the White Tern. Furthermore, a small area of breeding habitat for the Wedge-tailed Shearwater (listed as migratory	One Norfolk Island Pine tree in the northern portion of the Noth Zone as well as native and exotic vegetation along the banks of	Long Term	White Tern, Wedge-tailed Shearwater	Reduction in available breeding habitat for the White Tern and Wedge-tailed Shearwater. Reduction in available

Indirect Impact	Nature	Extent	Duration	Threatened Entities Likely Affected	Consequences
	under the EPBC Act) will be removed within the North Zone. Some of the beach habitat adjacent to the existing jetty will also be removed which provide potential foraging habitat for threatened/migratory shorebirds.	the lagoon and section of the beach adjacent to the existing jetty.			foraging habitat for shorebirds.

9.7. Prescribed Impacts

The Project has been assessed as resulting in five prescribed impacts (see ***Chapter 6***). An assessment of these prescribed impacts is provided below in accordance with Section 8.3 of the BAM. The location of prescribed impacts is shown in **Figure 14**.

9.7.1. Human-made Structures

9.7.1.1. Nature

Human-made structures to be impacted by the Project include two existing structures within the WMF in the South Zone as well as the removal of an annex on the current Ocean View Shed. Remaining human-made structures in the North zone will only be subject to upgrade works.

9.7.1.2. Extent

The impacts will be limited to the removal of two existing structures within the South Zone, the removal of an annex from the Ocean View Shed.

9.7.1.3. Duration

Impacts to the human-made structures would occur during the construction phase of the Project. The removal and upgrades of existing structures is a long-term impact.

9.7.1.4. Threatened Entities Affected

The habitat provided by the human-made structures may provide potential shelter and breeding habitat for threatened birds, reptiles and invertebrates. However, while these structures may offer potential habitat, no threatened species were recorded utilising these structures during field surveys and human-made structures are not considered preferred habitat by any threatened species considered to have the potential to occur.

9.7.1.5. Consequences

The Project will result in the loss of two human-made structures in the form of two sheds in the South Zone, as well as an annex on the current Ocean View Shed within the South Zone which provide potential shelter and breeding habitat for threatened birds, reptiles and invertebrates. While potential habitat is offered by these structures, no threatened species were recorded utilising these structures during field surveys. Furthermore, human-made structures to be removed or modified for the Project are not considered to form significant breeding or shelter habitat for these species and therefore not considered to be depended on for survival for threatened fauna species known to occur within the subject land or wider study area. Hence, no significant impacts to these species are expected from the removal of the human-made structures on the subject land.

9.7.2. Habitat Connectivity

9.7.2.1. Nature

The native vegetation within the subject land has the potential to function as stepping-stone habitat that connects larger areas of woody vegetation within the assessment area (see Figure 2). The woody vegetation proposed to be removed from within the subject land occurs as small patches around the edges of previous cleared areas.

9.7.2.2. Extent

Habitat connectivity will be marginally reduced by the removal of 0.75 ha of native vegetation within the subject land, including 0.14 ha within the North Zone and 0.61 ha within the South Zone. Removal of the native vegetation within the subject land will not result in further fragmentation of habitat in the locality, as it is only a very small decrease in total area and additional areas are proposed to be revegetated to ensure there is no net loss in the area of native vegetation and habitat available within the subject land and wider study area. Habitat connectivity can be seen in **Figure 14**.

9.7.2.3. Duration

Direct impacts to habitat connectivity would occur during the construction and operational phase of the Project. The reduction of habitat connectivity is considered to be a short-term impact given the Project includes revegetation and establishment of habitat as part of the Project's Landscape and Urban Design Plan.

9.7.2.4. Threatened Entities Affected

The habitat to be removed within the subject land offers potential foraging, shelter and breeding habitat for threatened birds, reptiles and invertebrates.

9.7.2.5. Consequences

The Project will result in the reduction of native vegetation within the subject land. The Project is likely to reduce habitat connectivity, predominantly within the North Zone, with the removal of shrubby vegetation along the top of the banks of the lagoon. However, habitat within the North Zone is already fragmented and provides predominantly stepping stone habitat for highly mobile birds. Within the South Zone, the Project requires removal of native vegetation along the edges of previously cleared areas, and connectivity between habitat in the wider study area will be maintained. Additionally, revegetation as part of the Project's Landscape and Urban Design Plan will ensure habitat connectivity is maintained in the long term. Although there will be some minor reduction in the habitat connectivity supported by the subject land, the overall subject land will continue to function as stepping-stone habitat between larger patches of vegetation and associated habitat within the wider assessment area in the long-term.

9.7.3. Non-native Vegetation

9.7.3.1. Nature

Non-native vegetation to be impacted by the Project occurs mainly as open areas of managed lawns within the subject land, as well as one Norfolk Island Pine tree.

9.7.3.2. Extent

The Project will clear a total of approximately 1.81 ha of non-native vegetation, including 0.33 ha within the North Zone and 1.48 ha in the South Zone. The majority of this comprises exotic dominated grasslands in the form of managed lawns however also includes one Norfolk Island Pine tree. Non-native vegetation within the subject land is shown on **Figure 14**.

9.7.3.3. Duration

Impacts to non-native vegetation would occur during the construction phase of the Project. The removal of the non-native vegetation is a long-term impact.

9.7.3.4. Threatened Entities Affected

The exotic grassland areas provide some potential foraging habitat for threatened species, particularly the Lord Howe Woodhen, however, are of low habitat value. The Norfolk Island Pine trees provide known breeding habitat for the White Tern.

9.7.3.5. Consequences

The Project will result in a reduction in non-native vegetation by approximately 1.81 ha. The reduction of this small area of habitat is not considered to significantly impact upon the potentially affected threatened entities as other areas of more suitable habitat will remain within wider assessment area. While the Norfolk Island Pine Tree to be removed will reduce the available breeding habitat for the White Tern, other Norfolk Island Pine trees will be retained within the subject land and are available within study area.

9.7.4. Water Bodies, Water Quality and Hydrological Processes

9.7.4.1. Nature

The Project required construction of a piled vessel ramp adjacent to the existing public jetty which will result in impacts to the Lord Howe Island lagoon. Furthermore, Cobbys Creek located within the study area in the South Zone is adjacent to the subject land and has the potential to be indirectly impacted by the Project.

9.7.4.2. Extent

Approximately 0.89 ha of the lagoon will be impacted for the construction of the piled vessel ramp. With the implementation of mitigation measures, additional impacts beyond the subject land are not expected.

9.7.4.3. Duration

Direct impacts on the lagoon involving the construction of the piled vessel ramp will be permanent. However, potential indirect impacts of the Project are expected to be short term, limited to the construction phase.

9.7.4.4. Threatened Entities Affected

The lagoon provides potential foraging habitat for threatened and migratory birds which forage on small fish and invertebrates in the ocean. Only a very small area of potential habitat is available, especially in context of the areas of the lagoon and areas of the Tasman Sea beyond that will remain available in the long term. As such, impacts on threatened species are expected to be minimal and not significant. It is noted that this BDAR only assesses terrestrial ecology and an assessment of marine ecology is provided in the Coastal and Marine Ecological Assessment (O2 Marine, 2025).

9.7.4.5. Consequences

The Project has the potential to result in increased sedimentation and runoff during construction and operational phases as well as direct impacts on the lagoon associated with the construction of the piled vessel ramp. Given the requirements of the Project to construct a new piled vessel ramp and upgrade the existing

jetty, impacts on the lagoon are unavoidable. Nevertheless, the habitat provided by the lagoon within the subject land comprises a very small area of potential habitat for threatened species within the assessment area. Mitigation measures will be implemented to minimise impacts of the Project on the lagoon during the construction phase of the Project. This includes avoiding positioning laydown and stockpile areas directly adjacent to the lagoon and the implementation of sediment and runoff controls. As such, impacts on water quality within the lagoon are expected to be short term.

9.7.5. Vehicle Strike

9.7.5.1. Nature

The construction of access roads and hardstands/laydown areas within the subject land may result in an increase in the number of vehicles that will be accessing the subject land however is not considered to be significantly greater than existing conditions. While new infrastructure facilities will be constructed, these marine freight and waste management services will continue to be undertaken based on the existing services.

9.7.5.2. Extent

The risk of vehicle strike will largely occur within the access roads and hardstand areas of the subject land.

9.7.5.3. Duration

The impacts of vehicle strike are long-term but are likely to be sporadic, based on the frequency of services being undertaken on the island.

9.7.5.4. Threatened Entities Affected

The Lord Howe Woodhen is the most likely threatened species to be subject to vehicle strikes. While not threatened, other commonly occurring species such as the Buff-banded Rail as well as Mutton birds such as the Wedge-tailed Shearwater have also been recorded regularly crossing and roosting on roadways and would be subject to vehicle strikes.

9.7.5.5. Consequences

The operational and construction phases of the Project will involve the movement of vehicles thereby increasing the risk of fauna vehicle strikes. However, vehicle movements are expected to be very slow, including transporting materials between the North and South Zone during construction, and forklift activity, public access to the boat ramp and waste drop off/management during operations. While speed limits on Lord Howe Island don't exceed 25km/hr, additional speed limits will be identified for vehicles entering the site to minimise potential vehicle strikes and for personal safety. Further details on vehicle speeds and mitigation measures are provided in the Transport and Traffic Assessment (Amer Organisation, 2025). Furthermore, wildlife signs (i.e. Lord Howe Island Woodhen and Wedge-tailed Shearwater) will be installed to ensure motorists are aware of fauna that may cross roads and hardstand areas.

10. Mitigation Measures

10.1. Mitigation of Impacts to Native Vegetation and Habitat

A range of mitigation measures have been developed for the Project to mitigate the impacts to native vegetation and habitat that is unable to be avoided. The mitigation measures are to be detailed within a site-specific Biodiversity Management Plan (BMP) to be prepared for the subject land. These include a range of measures to be undertaken before and during construction to limit the impact of the Project. Each mitigation measure is discussed in detail below, and a summary is provided in Table 15.

10.1.1. Delineation of Clearing Areas

To avoid unnecessary removal or damage to the nearby vegetation, the clearing area (i.e. the subject land) should be clearly demarcated and signed, where appropriate to ensure no vegetation beyond these boundaries is removed.

Areas that require clearance will be flagged and clearly delineated with temporary fencing (or similar) to ensure that no areas beyond the subject land are inadvertently cleared during the construction process. No machinery will be parked on areas beyond the temporary fencing and no access will be allowed during construction. Ancillary facilities such as stockpile sites, site compounds and construction zones will not be located beyond the limits of clearing.

10.1.2. Timing of Clearing

Due to the presence of nesting sites for threatened and migratory birds within the subject land, vegetation clearance is to be undertaken outside of the key migration and breeding periods for threatened and migratory birds. This includes the threatened White Tern, as well as the migratory Wedge-tailed Shearwater, which are both known to nest and breed within the subject land over Spring/Summer (extending from late August to early May). Where possible, vegetation clearance should be undertaken from late May to early August.

10.1.3. Tree Protection Measures

Tree protection measures should be implemented for trees identified to be retained within the subject land and adjoining areas where structural root zones have the potential to extend into the subject land.

10.1.4. Pre-clearance Surveys

Pre-clearance surveys are to be undertaken by a suitably qualified ecologist. Pre-clearance surveys will include identification of key habitat features as well as searches for the Lord Howe Placostylus. Given the small area of habitat to be impacted, pre-clearance surveys should be undertaken immediately prior to vegetation clearance (1-2 days). The pre-clearance surveys will include:

- Demarcation of key habitat features such as nests, hollow-bearing trees, burrows, fallen logs and rock;
- Checking trees for the presence of bird within nests and/or microchiropteran bats within tree hollows;
- Checking logs and rocks for the presence of reptiles and the Lord Howe Placostylus;
- Animals found to be occupying trees and habitat will be safely removed before the clearing of trees and relocated into nearby vegetation;

- Survey and translocation of the Lord Howe Placostylus as detailed further in ***Section 10.1.7***.
- Provision of a report following the completion of a pre-clearance survey detailing the results, including locations of habitat features, fauna encountered and recommendations to minimise impacts on native fauna species during vegetation clearing.

10.1.5. Clearance Supervision

An ecologist should be present while clearing to capture and relocate animals encountered during the clearance operation, including species inadvertently injured. Provisions will be made to protect any native fauna during clearing activities by the following means:

- All persons working on the vegetation clearing will be briefed about the possible fauna present and should avoid injuring any present;
- Animals disturbed or dislodged during the clearance but not injured should be assisted to move to the adjacent retained vegetation or other specified locations; and
- If animals are injured during the vegetation clearance, the LHIB will be notified and if required the local vet contacted to assess the injured animal. Appropriate steps will be taken to treat the animal, however, if the animal is unlikely to survive, it will be humanely euthanised.

10.1.6. Fauna Handling Protocols

Fauna handling will be undertaken by experienced ecologists. Ecologists are responsible for capturing vertebrate fauna as well as the Lord Howe Placostylus, during the habitat clearing process. Ecologists employed to undertake pre-clearance surveys and clearance supervision will be required to hold the necessary licences to capture and relocate native fauna. Specific protocols for the handling of birds, reptiles and the Lord Howe Placostylus are to be developed and included within the Project's BMP.

10.1.7. Lord Howe Placostylus Translocation Plan

A translocation plan for the Lord Howe Placostylus is to be incorporated into the Project's BMP. The translocation plan is to be prepared in accordance with the NSW Policy for the Translocation of Threatened Fauna (DPIE, 2019).

During pre-clearance surveys, targeted searches for the Lord Howe Placostylus are to be undertaken. Firstly, nocturnal active searches should be undertaken over a minimum of two consecutive nights to search for any active individuals. This will involve spotlighting surveys across transects within areas of suitable habitat in the subject land. Where individuals are encountered, they are to be captured and relocated as outlined in the sections below. Following the nocturnal active searches, all areas of leaf litter within the South Zone are to be manually raked, with the litter collected and distributed within retained areas of the study area. Given the clearing area within the South Zone is located along the edge of a large patch of vegetation to be retained, the litter should be raked back and spread out in the immediately adjoining areas.

An ecologist is to be present to supervise the removal of vegetation and associated habitat within the subject land in order to capture and relocate any individuals as required.

Although the Lord Howe Placostylus has not been recorded within areas of vegetation to cleared within the subject land, there is potential habitat to be removed. If the Lord Howe Placostylus is encountered during pre-clearance surveys or clearance supervision, the following procedures are to be followed.

a. Holding

All live individuals, along with a small amount of topsoil, will be collected and placed into a container. Containers are to be enclosed with small air holes to allow for the movement of air in and out of the container. All individuals should be released on the same day of capture and not held overnight.

b. Relocation

Any individual snails captured are to be released into areas of suitable habitat within the study area, of which should be as close to the capture location as possible. A map of suitable relocation sites is to be included within the BMP.

10.1.8. Landscaping and Revegetation

Landscaping works will be undertaken within the subject land in accordance with the Project's Landscape and Urban Design Plans prepared by Spackman Mossop Michaels in association with Lahznimmo Architects (2025). The Landscape and Urban Design Plans includes a detailed planting plan that identifies areas of the subject land that will be subject to revegetation. All areas identified for landscaping will be revegetated with native species to re-establish native vegetation communities. The Landscape and Urban Design Plans provide a detailed planting schedule that includes the pot size, mature height and spread of species and the quantity proposed to be planted per square metre. The procurement of native plantings will be from the local nursery on Lord Howe Island, and consultation has already been undertaken to ensure plants will be available for planting based on the Project schedule.

The BMP is to identify performance targets along with maintenance, monitoring and reporting requirements to ensure the success of revegetation within landscaped areas.

10.1.9. Weed Management

On Lord Howe Island, weeds are prioritised and categorised as part of the *North Coast Local Land Services Regional Strategic Weed Management Plan 2023 – 2027* (North Coast Local Land Services, 2022). However, management priorities to demonstrate compliance with the general biosecurity duty as identified in the Lord Howe Island Weed Management Strategy (LHIB, 2016) and EIS Chapter 6.13 Biosecurity.

In order to minimise the spread of weeds throughout the subject land and adjoining areas, appropriate weed control activities will be undertaken in accordance with the Lord Howe Island Weed Management Strategy (LHIB, 2016). The following goals and strategies are identified in the Weed Management Strategy which will deliver best practice weed management outcomes on Lord Howe Island and are to be considered in developing weed management measures.

i. Goal 1 – Exclude: Prevent the establishment of new invasive weeds

Identification of high-risk pathways and interception of high-risk species. Appropriate construction site hygiene measures will be implemented to prevent entry of new weeds to the area such as the cleaning of equipment prior to transport to Lord Howe Island.

A wash down station is to be established and all construction entering and leaving the site will be required to be washed down to prevent weed seeds entering or leaving the site. These procedures will also assist in preventing the introduction and spread of *Phytopthora cinnamomi*, which is a pathogen of native vegetation that is carried in contaminated soil.

ii. Goal 2 – Eradication: Eliminate or prevent the spread of invasive weeds

Initial weed management will be carried out within the subject land according to best-practice methods. The targeted species include those listed in Appendix A of the Weed Management Strategy. Initial weed treatment will include eliminating woody species and targeting large dominant infestations of exotic understorey species (grasses and herbs). This may be achieved via a combination of manual weed removal and herbicide use.

Weed management measures should avoid adverse impacts to retained vegetation within the subject land, including not over clearing (remove only targeted species), employment of minimal disturbance techniques to avoid soil and surrounding vegetation disturbance.

iii. Goal 3 – Manage effectively: Reduce the impact of widespread, non-eradicable invasive weeds

Eradication is not considered to be possible for many of the weeds identified on Lord Howe Island and given many of these do not pose a significant risk to biodiversity, control of these species should focus on containment. Follow-up monitoring and maintenance should be undertaken in the subject land following vegetation clearing activities, to contain any re-emergence of weed species.

iv. Goal 4 – Build capacity: Ensure that Lord Howe Island has the ability and commitment to manage invasive weeds and to promote awareness of invasive weeds within the community.

Weed management is to be undertaken by competent, skilled and motivated weed-eradication staff. Where necessary, consultation with the LHIB and community members may be required to gain local knowledge.

Maintenance, monitoring and reporting requirements along with responsibilities to ensure weed management measures are implemented are to be identified in the Projects BMP.

The LHIB currently implements a Weed Eradication Program (WEP) in accordance with the Weed Management Strategy, which proposes the eradication of at least 25 priority invasive weeds that occur on Lord Howe Island.

10.1.10. Erosion, Sedimentation and Pollution Control

Potential impacts to terrestrial flora and fauna, as well as marine ecology within the lagoon, occurring in the construction phase that can be managed include: run-off, sedimentation, erosion and pollution. To reduce sedimentation on the construction site, erosion control measures should be implemented. This includes minimising the area of soil exposed on the site at any given time. All soil stockpiles should be adequately covered when not in use to prevent erosion from heavy rainfall. Sediment fences should be established around the perimeter of the development area to prevent the impacts of sedimentation on the adjoining areas. During

development, precautions should be taken to ensure that no pollution, such as petrochemical substances or water containing suspended solids, escapes the construction site. Pollution traps and efficient removal of pollution to an off-site location would help to minimise pollution impacts.

10.1.11. Speed Limits and Signage (Construction)

As outlined in ***Section 9.7.5*** speed limits will be enforced and signage installed to minimise risk of vehicle strikes on native fauna species. Several species including the Lord Howe Island Woodhen and Wedge-tailed Shearwater are frequently encountered on roads and within hardstand areas and the enforcement of speed limits will reduce the chances of vehicle strike. A maximum speed of 25km/hr applies to roads on Lord Howe Island, which minimises the risk of vehicle strikes along existing access roads during construction, whilst also ensuring personal safety. Speed limits will also be enforced for the Project to reduce the risk of vehicle strike Further details on vehicle speeds and mitigation measures are provided in the Transport and Traffic Assessment (Amer Organisation, 2025).

Whilst managing speed limits will largely reduce the risk of vehicle strike, additional signage may be required in proximity to the subject land to be installed to warn motorists of the fauna that may be present on roads and within operational areas. Additional wildlife signage would only be required if existing signage is not located in proximity to the subject land. Any new signage will be consistent with existing signage on Lord Howe Island, including the identification of the Lord Howe Island Woodhen and Mutton Birds such as the Wedge-tailed Shearwater.

Further details on the signage and suitable locations are to be identified in the Project's BMP.

Table 15 Summary of mitigation measures

Mitigation Measure	Impact Addressed	Proposed Techniques	Timing	Frequency	Responsibility	Risk of Failure	Consequences of Residual Impacts
Delineation of clearing limits	Indirect, prescribed	Clearing limits marked either by high visibility tape on trees of metal/wooden pickets, fencing or an equivalent boundary marker. Disturbance, including stockpiling, restricted to clearing limits.	Construction	Once	Contractor	Low	Unnecessary damage to retained native vegetation and adjoining native vegetation.
Timing of clearing	Direct	Where possible, vegetation clearance should be undertaken from late May to early August, which are outside of the key migration and breeding periods for threatened and migratory birds which extend from late August to early May.	Construction	Prior to construction	Contractor	Low	Increased and unnecessary mortality of threatened and migratory fauna known to breed within the subject land.
Tree Protection Measures	Indirect, prescribed	Implementation of tree protection measures	Construction	Prior to construction and vegetation clearing	Contractor	Low	Unnecessary damage to retained trees within and adjacent to the subject land.
Pre-clearance survey	Direct, prescribed	Pre-clearance surveys will be conducted in all areas of vegetation that are required to be cleared.	Construction	Once	Contractor	Moderate	Increased and unnecessary mortality of native fauna.

Mitigation Measure	Impact Addressed	Proposed Techniques	Timing	Frequency	Responsibility	Risk of Failure	Consequences of Residual Impacts
		Pre-clearance surveys will be undertaken within one week of clearing. Habitat features will be identified during pre-clearance surveys.					
Clearing supervision	Direct, prescribed	Vegetation clearance will be undertaken under ecological supervision. Animals disturbed or dislodged during the clearance but not injured will be assisted to move to adjacent bushland or other specified locations. If animals are injured during the vegetation clearance, appropriate steps will be taken to humanely treat the animal (LHIB contacted and if required taken to the local vet, or if the animal is unlikely to survive, it will be humanely euthanised).	Construction	Once	Contractor	Moderate	Increased and unnecessary mortality of native fauna.
Fauna Handling Protocols	Direct, prescribed	Fauna handling will be undertaken by experienced ecologists who hold the necessary licences to capture and relocate native fauna. Specific protocols for the handling of birds, reptiles and the Lord Howe Placostylus are to be implemented.	Construction	Throughout construction period	Contractor	Low	Increased and unnecessary mortality of native fauna.

Mitigation Measure	Impact Addressed	Proposed Techniques	Timing	Frequency	Responsibility	Risk of Failure	Consequences of Residual Impacts
Lord Howe Placostylus Translocation Plan	Direct	A translocation plan is to be developed for the Lord Howe Placostylus that includes a summary of the Project, occurrence of the species, aims of translocation, suitable recipient locations, methods for capture, holding and relocation and monitoring and reporting.	Prior to construction	Once	Contractor	Low	Increased mortality of the Lord Howe Placostylus.
Landscaping and Revegetation	Direct, prescribed	Landscaping and revegetation will be undertaken within the subject land using species local provenance species sourced from the Lord Howe Island Nursery.	Post construction	Post construction and for the life of the development	Contractor	Moderate	Short to medium term loss of native vegetation and habitat connectivity
Weed management	Direct, indirect	Appropriate weed control activities will be undertaken in accordance with the *North Coast Local Land Services Regional Strategic Weed Management Plan 2023 – 2027* (North Coast Local Land Services, 2022) and Lord Howe Island Weed Management Strategy (LHIB, 2016).	Construction	Prior to construction, following vegetation clearing	Contractor	Moderate	Further Spread of weeds throughout the surrounding land.
Erosion, sedimentation and pollution control	Indirect, prescribed	Construction activities will be undertaken in accordance with "The Blue Book" (Landcom, 2004). These include implementation of the following measures:	Construction	Throughout construction period	Contractor	Moderate	Sedimentation into adjoining vegetation and the Lagoon.

Mitigation Measure	Impact Addressed	Proposed Techniques	Timing	Frequency	Responsibility	Risk of Failure	Consequences of Residual Impacts
		Installation of sediment control fences; Covering soil stockpiles; and Avoiding soil disturbance prior to heavy rainfall.					

10.2. Mitigation of Prescribed Impacts

The following mitigation measures, described in ***Section 10.1***, are applicable to the prescribed impacts relevant to the Project:

- Delineation of clearing limits;
- Timing of clearing;
- Tree protection measures;
- Pre-clearance surveys;
- Clearing supervision;
- Fauna handling protocols;
- Lord Howe Placostylus Translocation Plan;
- Landscaping and revegetation;
- Weed management;
- Erosion, sedimentation and pollution controls; and
- Speed limits and signage.

No additional measures are proposed for prescribed impacts.

10.3. Adaptive Management for Uncertain Impacts

The Project is considered unlikely to result in any uncertain impacts that require adaptive management.

10.4. Use of Biodiversity Credits to Mitigate or Offset Indirect or Prescribed Impacts

As the BAM does not apply to biodiversity endemic to Lord Howe Island, it is not possible to calculate biodiversity credits. As such biodiversity credits cannot be used to mitigate or offset indirect or prescribed impacts. Nevertheless, given the small scale of indirect and prescribed impacts, offsetting of indirect or prescribed impacts in not considered to be required.

11. Thresholds for Assessment

11.1. Introduction

Under the BAM, the assessment thresholds that must be considered in a BDAR include the following:

- Impacts on an entity that is at risk of a serious and irreversible impact;
- Impacts for which the assessor is required to determine an offset requirement;
- Impacts for which the assessor is not required to determine an offset requirement; and
- Impacts that do not require further assessment by the assessor.

As the BAM does not apply to biodiversity endemic to Lord Howe Island, the following sections are not applicable.

11.2. Impacts on Serious and Irreversible Impact Entities

An assessment of SAII is not applicable to biodiversity endemic to Lord Howe Island. As identified in the TBDC profiles, *"entities endemic to Lord Howe Island are not assessed under the BOS"*. Furthermore, none of the other threatened species known to occur within the subject land or identified as potentially occurring are listed as SAII entities.

11.3. Impacts that Require an Offset

This section is not applicable as the BAM does not apply. Offsets cannot be calculated in accordance with the BOS. An FFA has been prepared for the Project which is provided in **Appendix A**. The FFA concluded that the Project is unlikely to have a significant impact on threatened entities listed under the BC Act. In order to offset the removal of native vegetation and associated habitat for threatened species, the Project has included the preparation of a Landscape and Urban Design Plan which identifies areas of the subject land and wider study area for revegetation. Overall revegetation will be undertaken for a minimum of 0.75 ha, which is equivalent to the area of vegetation proposed for removal (0.75 ha), to ensure there is no net loss in the total area of native vegetation and associated habitat within the subject land. Additional opportunities for revegetation will be explored during the preparation of the Site Establishment Management Plan. As such, no additional offsetting measures are proposed.

11.4. Impacts that do not Require an Offset

This section is not applicable as the BAM does not apply and the offsets cannot be calculated in accordance with the BOS. Nevertheless, Appendix D of the BAM indicates that planted native vegetation does not require an offset. As such, removal of native vegetation classified as environmental plantings would not require offsetting.

11.5. Application of the No Net Loss Standard

The BAM sets a standard that will result in no net loss of biodiversity values where the impacts on biodiversity values are avoided, minimised and mitigated, and all residual impacts are offset by retirement of the required

number of biodiversity credits. This section is not applicable as the BAM does not apply and the offsets cannot be calculated in accordance with the BOS.

Nevertheless, as biodiversity credits cannot be calculated, the removal of a native vegetation and habitat within the subject land is proposed to be offset through the revegetation of land within the subject land to ensure that there is no net loss in the area of native vegetation and associated habitat. The Project has included the preparation of a detailed Landscape and Urban Design Plan which identifies areas within the subject land that will be subject to revegetation following construction and remediation. The total area of native vegetation to be removed within the subject land comprises 0.75 ha, while a minimum of 0.75 ha is proposed to be revegetated within the subject land. Therefore the Project will result in a no net loss of native vegetation and associated habitat within the subject land.

12. Conclusion

This BDAR has been prepared to assess the impacts of the Project on biodiversity values in accordance with the BAM. The Project involves the construction, operation and maintenance of new marine infrastructure, cargo handling facility, biosecurity infrastructure and waste management facility on Lord Howe Island, and associated landscape and vegetation restoration.

The Project seeks development consent as CSSI under Division 5.2, subdivision 5.13 of the EP&A Act. The Project is a controlled action (2025/10188) under the EPBC Act 1999 and will be assessed under the bilateral agreement between the NSW and Commonwealth Governments.

Under the BC Act, CSSI Projects requiring development consent under Part 5.13 of the EP&A Act must be assessed using the BAM with the results presented in a BDAR, and therefore this BDAR has been prepared to accompany the CSSI application for the Project. However, as outlined in Section 1.5 of the BAM (2020a), the BAM does not apply to biodiversity that is endemic to Lord Howe Island and therefore a number of sections within this BDAR cannot be prepared strictly in accordance with the BAM. In particular, PCTs have not been identified on Lord Howe Island and therefore it is not possible to use the BAM-C to determine vegetation integrity scores, identify ecosystem and species credit species or calculate offset requirements in accordance with the BOS. Furthermore, a number of components required under the BAM such as the identification of native vegetation cover, patch size and vegetation zones are not required as these are used in the BAM-C to assess vegetation integrity and habitat suitability for threatened species. Nevertheless, these components have been completed where possible. Where sections of this BDAR cannot be prepared, relevant information has been provided to assess biodiversity values, including references to the Flora and Fauna Assessment (FFA) provided in **Appendix A**, which includes further assessment of the Project on biodiversity within the Project Area.

The classification of vegetation communities has been undertaken in accordance with the community profiles identified in the 2016 floristic study (Sheringham et al., 2016a). Several areas within the study area have shown evidence of recent regeneration which has resulted in redefining the boundaries of the vegetation communities present. A total of ten native vegetation communities were identified within the subject land. None of the vegetation communities within the subject land were a TEC listed under the BC Act or EPBC Act.

No threatened flora species were recorded within the subject land and none are considered likely to occur. Seven threatened fauna species were identified within the subject land and a further six threatened fauna species were identified within the study area and considered to have the potential to occur within the subject land. Furthermore, one migratory species has been identified within the subject land, while a further eight migratory species are considered to have the potential to occur. An assessment of the impacts from the Project on threatened and migratory species concluded that the Project is unlikely to result in a significant impact on any of the assessed species.

The Project has been through several design iterations to avoid and minimise direct, indirect and prescribed impacts for threatened and migratory species while still meeting the construction and operation requirements for the Project. Where avoidance of native vegetation was not possible, mitigation measures have been proposed to minimise and manage the impacts to biodiversity values, such as delineation of clearing areas, timing of clearing, tree protection measures, pre-clearance surveys, clearance supervision, fauna handling

protocols, a translocation plan, landscaping and revegetation, weed management, erosion and sediment management and speed limits and signage.

The Project is considered to be consistent with the No Net Loss standard as impacts to biodiversity values have been avoided/minimised/mitigated where feasible and all residual impacts are to be offset through the revegetation of native vegetation within the subject land.

13. References

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APPENDIX A :

Flora and Fauna Assessment

Lord Howe Island Critical Infrastructure Project

Flora and Fauna Assessment

APP Corporation Pty Ltd

26 September 2025

Final

cumberland ecology

PART OF SLR

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Report No. 23150RP3

The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or recommendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

Version	Date Issued	Prepared by	Details
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Approved by:	Matt Freeman
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Signed:	
Date:	26 September, 2025

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Glossary

Term / Abbreviation	Definition
BAM	Biodiversity Assessment Method
BC Act	NSW *Biodiversity Conservation Act 2016*
BC Regulation	NSW *Biodiversity Conservation Regulation 2017*
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	NSW *Biosecurity Act 2015*
Bonn Convention	Convention on the Conservation of Migratory Species of Wild Animals
BOS	Biodiversity Offset Scheme
CAMBA	China–Australia Migratory Bird Agreement
CEEC	Critically Endangered Ecological Community
Commonwealth DCCEEW	Commonwealth Department Climate Change, Energy, the Environment and Water
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
'E'	Endangered
EHG	Environment and Heritage Group
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
ha	Hectares
JAMBA	Japan–Australia Migratory Bird Agreement
Lord Howe Island DCP	*Lord Howe Island Development Control Plan 2010*
Lord Howe Island LEP	*Lord Howe Island Local Environment Plan 2010*
MNES	Matters of National Environmental Significance
NSW	New South Wales
PMST	Protected Matters Search Tool
ROKAMBA	Republic of Korea–Australia Migratory Bird Agreement
SEARs	Secretary's Environmental Assessment Requirements
CSSI	Critical State Significant Infrastructure
Study area	North and South Zone investigation areas
TEC	Threatened Ecological Community
the 'Proponent'	NSW DCCEEW
the 'Project'	Lord Howe Island Critical Infrastructure Project
The 'Strategy'	*Lord Howe Island Weed Management Strategy 2016-2025*
'V'	Vulnerable

1. Introduction

The NSW Department of Climate Change, Energy, the Environment and Water ('NSW DCCEEW' or 'Proponent'), on behalf of the Lord Howe Island Board (LHIB), proposes the construction, operation and maintenance of new marine infrastructure, cargo handling facility, biosecurity infrastructure and waste management facility on Lord Howe Island, and associated landscape and vegetation restoration.

The Proponent seeks development consent for the Project as Critical State Significant Infrastructure (CSSI) under Division 5.2, subdivision 5.13 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project is a controlled action (2025/10188) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) and will be assessed under the bilateral agreement between the NSW and Commonwealth Governments.

The Project is part of the broader Lord Howe Island Critical Infrastructure Program; however, the aspects being considered within this report comprise the construction, operation and maintenance of the following on Lord Howe Island:

- Freight handling facility which includes new and upgraded marine infrastructure (new piled vessel ramp and upgraded jetty and existing ramp), boat wash down and maintenance area, cargo loading/offloading areas, biosecurity infrastructure, adaptive reuse of the 'Old Cargo Shed' and 'Ocean View' heritage buildings, viewing area, picnic area, landscaping, retaining walls, amenities and vehicle and boat trailer parking;
- Waste management facility (WMF) upgrades which include new storage sheds and materials processing facilities (including for organic material), wastewater treatment plant and waste receival area (including chemical and hazardous waste), hardstand and roads, staff office, and selective dune restoration at the existing WMF;
- Dedicated dog kennels to house detection dogs; and
- Self-service fuel bowser along Old Lagoon Road.

The Project will include works within two western areas on Lord Howe Island referred to collectively as the 'Project Area'. Within the Project Area, a terrestrial study area ('study area') has been identified, which includes two areas referred to hereafter as the 'North Zone' and 'South Zone'. The North Zone includes marine and land-based infrastructure, including a freight handling facility, a piled vessel ramp and biosecurity infrastructure. The South Zone includes the WMF, dog kennels and a fuel bowser. A terrestrial disturbance area for the development footprint of the proposed built infrastructure has also been identified within the study area which includes all areas directly impacted by the Project during construction and operation, and referred to hereafter as the 'subject land' (**Figure 1**). The layout of the Project is shown in **Figure 2** and **Figure 3**.

Secretary's Environmental Assessment Requirements (SEARs) were issued by the Department of Planning, Housing and Infrastructure (DPHI) on 14 April 2025. Following the Referral decision issued by the Commonwealth Department of Climate Change, Energy, the Environment and Water (Commonwealth DCCEEW), and identification of the assessment approach under the Bilateral Agreement, the DPHI issued Supplementary SEARs on 8 August 2025 which included the assessment of MNES in accordance with the Referral decision.

In accordance with the Project SEARs, SLR Consulting Australia Pty Ltd (SLR; now a parent company for Cumberland Ecology) has prepared this Flora and Fauna Assessment (FFA) on behalf of the Applicant to support the Biodiversity Development Assessment Report (BDAR) in assessing the terrestrial biodiversity impacts of the Project.

The study area includes marine environments within the lagoon, which adjoin the North and South Zones. Impacts to fauna in the lagoon are not assessed by this FFA, but are covered in the Coastal and Marine Ecological Assessment (O2 Marine, 2025).

1.1. Purpose

The purpose of this report is to describe the current biodiversity values of the study area and to assess the potential impacts of the Project on flora and fauna, particularly threatened species, populations, and communities that are listed under the New South Wales (NSW) *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The specific objectives of this report are to:

- Describe the survey methodology;
- Identify and map the vegetation communities of the study area;
- Identify fauna habitats and fauna usage of the study area;
- Identify and map the location of any threatened species, populations or ecological communities listed under the BC Act and/or EPBC Act recorded within the subject land and study area;
- Assess the likelihood of occurrence of threatened species, populations or communities listed under the BC Act and/or EPBC Act within the subject land;
- Assess the potential impact of the Project on threatened species, populations or communities listed under the BC Act and/or EPBC Act, including Tests of Significance under Section 7.3 of the BC Act; and
- Describe the avoidance, mitigation and management measures that have been implemented for the Project to avoid or minimise impacts on biodiversity values.

This FFA has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) issued by the Department of Planning and Environment on 8 August 2025 (SSI-78107213).

1.2. Background

1.2.1. Site Description

The focus of the FFA is on terrestrial habitats on the western edge of Lord Howe Island, which is part of a group of islands in the southern Pacific Ocean. Prior to human settlement, the biota of this island group existed and evolved in relative isolation resulting in a relatively high proportion of endemic species, and migratory species of high conservation values. The Lord Howe Island Group has World Heritage status because of its diverse and unique biodiversity.

The biodiversity of the island includes resident terrestrial bird species that occur year-round, and migratory bird species that come ashore seasonally to breed.

The Lord Howe Island Group is an excellent example of oceanic islands of volcanic origin supporting a unique ecological assemblage of plants and animals. It provides important breeding grounds for colonies of seabirds as well as providing vital natural habitat for the conservation of threatened species. Examples of such include endemics such as the flightless Lord Howe Woodhen (*Hypotaenidia sylvestris*), once regarded as one of the rarest birds in the world, and the Lord Howe Island Phasmid (*Dryococelus australis*), the world's largest stick insect that was thought extinct until it was rediscovered on a nearby volcanic sea stack known as Balls Pyramid.

The island group provides habitat for extensive colonies of nesting seabirds, making them very important over a vast oceanic region. For example the islands are the only major breeding locality for the Providence Petrel (*Pterodroma solandri*), and they include one of the world's greatest breeding occurrences of Red-tailed Tropicbird (*Phaethon rubricauda*).

Lord Howe Island has many endangered endemic species or subspecies of plants and animals, with fauna including vertebrates and invertebrates. Some of these species occur within the lowlands where the study area is located and so there is potential for impacts on such biota.

Lord Howe Island is comprised of volcanic peaks at the northern and southern ends, between which are gently undulating coastal lowlands. The coastal lowlands have experienced the greatest degree of development since the island was first settled, in 1834, and more recently since the construction of the airport in 1974. The western side of the island is enclosed by a shallow coastal lagoon, while the eastern side of the island has smaller lagoons and more frontage to deeper ocean waters.

The North and South Zones are located on the western side of the island in the coastal lowlands. They include some areas of old farmlands, some areas of plantations of Kentia Palms, and some remnant and regenerating native vegetation.

Within the North Zone there is existing marine infrastructure, including the existing jetty, cargo loading and offloading areas, associated buildings, exotic and native vegetation including mown grasslands, shrubs and trees. However, small sections of the sandy/rocky beach along the foreshore of the lagoon are also present. The soils are predominantly comprised of coral sands however, the areas in the most northerly portion of the study area (beyond the subject land) include a mixture of coral sands and calcarenite rock.

Within the South Zone there is the existing WMF, as well as areas of remnant native vegetation, managed grasslands and cleared land. Small sections of sandy beach form the western margin of this zone, along the foreshore of the lagoon. The soils within the South Zone are comprised of predominantly coral sands.

1.3. Authors and Contributors

This document has been prepared by Matthew Freeman with assistance from personnel as outlined in **Table 1**.

Table 1 Personnel

Name	Relevant Qualifications / Training	Tasks
Matthew Freeman	Bachelor of Natural Science (Nature Conservation) University of Western Sydney, 2012. BAM Accredited Assessor Training, Muddy Boots 2018. BAM Accredited Assessor Renewal Training, Greencap 2022. BAM Accredited Assessor Renewal Training, DCCEEW 2025 (Accredited to April 2028)	Report preparation, vegetation mapping, targeted threatened flora searches, targeted threatened and migratory fauna surveys, data analysis.
Dr David Robertson	Doctor of Philosophy. Ecology, University of Melbourne, 1986 Bachelor of Science (Honours) in Ecology, University of Melbourne, 1980 BAM Accredited Assessor Training, Muddy Boots 2017. BAM Accredited Assessor Renewal Training, Greencap 2021. BAM Accredited Assessor Training, Greencap 2024 (Accredited to October 2027)	Report preparation, site inspection
Dr Trevor Meers	Doctor of Philosophy, Restoration Ecology. University of Melbourne, 2007 Bachelor of Applied Science (Honours) in Natural Resource Management. Deakin University, 2002 BAM Accredited Assessor Training, Muddy Boots 2017. BAM Accredited Assessor Renewal Training, Greencap 2021. BAM Accredited Assessor Training, Greencap 2024 (Accredited to July 2027)	Vegetation mapping, BAM plot surveys, targeted threatened flora surveys, document preparation assistance
Mikael Peck	Master of Marine Science and Management. Macquarie University, 2013 Bachelor of Science. Washington State University, 2005 BAM Accredited Assessor Training, Muddy Boots 2017. BAM Accredited Assessor Renewal Training, Greencap 2022. BAM Accredited Assessor Training, 2025 (Accredited to February 2028)	Report review, and targeted threatened and migratory fauna surveys
Heather Gosper	Bachelor of Environmental Science and Management. The University of Newcastle, 2013	Targeted threatened and migratory fauna surveys

Name	Relevant Qualifications / Training	Tasks
	BAM Accredited Assessor Training, Muddy Boots 2017. BAM Accredited Assessor Training, Greencap 2023 (Accredited to June 2026)	
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Michael Davis	Bachelor of Natural Science (Nature Conservation) University of Western Sydney, 2012. BAM Accredited Assessor Training, Muddy Boots 2018. BAM Accredited Assessor Renewal Training, Greencap 2022. BAM Accredited Assessor Renewal Training, DCCEEW 2025 (Accredited to April 2028)	GIS mapping, figure preparation
Jesse Luscombe	Doctor of Philosophy. Ecology, University of Melbourne, 1986 Bachelor of Science (Honours) in Ecology, University of Melbourne, 1980 BAM Accredited Assessor Training, Muddy Boots 2017. BAM Accredited Assessor Renewal Training, Greencap 2021. BAM Accredited Assessor Training, Greencap 2024 (Accredited to October 2027)	GIS mapping, figure preparation

2. Regulatory Framework

This section describes legislative requirements for ecological assessments that are required to be addressed as part of the development approval process for the Project.

2.1. New South Wales Legislation

2.1.1. NSW Environmental Planning and Assessment Act 1979

The NSW *Environment Planning and Assessment Act 1979* (EP&A Act) is the overarching planning legislation in NSW. This Act provides for the creation of planning instruments that guide land use. The EP&A Act also provides for the consideration of the environment and biodiversity values, which is addressed in Section 1.7 and requires application of Part 7 of the BC Act. This includes threatened species, communities, habitat and processes as listed under the BC Act and *Fisheries Management Act 1994*.

Due to the location of the Project within a sensitive environmental location and an estimated development cost (exceeding $30 million), the Project comprises a CSSI development and will require the issue of the SEARs by the DPHI. As such, the Project is subject to the environmental impact assessment and planning approval requirements of Part 5, Division 5.2 of the EP&A Act.

In accordance with Part 5 of the EP&A Act, the proponent and determining authority, must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed works.

2.1.2. NSW Biodiversity Conservation Act 2016

The BC Act is the key piece of legislation in NSW relating to the protection and management of biodiversity and threatened species. The purpose of the BC Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. The BC Act is supported by several regulations, including the *Biodiversity Conservation Regulation 2017* (BC Regulation).

Section 7.9 of the BC Act requires all development applications for State Significant Development (SSD) or State Significant Infrastructure (SSI) to be accompanied by a Biodiversity Development Assessment Report (BDAR) unless both the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have a significant impact on biodiversity values.

All BDAR's are to be prepared in accordance with the NSW Biodiversity Assessment Method (BAM) which forms part of the NSW Biodiversity Offsets Scheme. As outlined in Section 1.5 of the BAM (2020), the BAM cannot be used to assess biodiversity that is endemic to Lord Howe Island. As such, it is not possible to prepare a BDAR for the Project strictly in accordance with the BAM.

Following consultation with the NSW Department of Planning, Housing and Infrastructure (DPHI), and in accordance with the SEAR's issued for the Project, an FFA or Species Impact Statement, depending on whether the Project is deemed to have a significant impact on biodiversity values, is required to support the BDAR and provide additional assessment of biodiversity values. As such, this FFA has been prepared.

2.1.3. NSW Biosecurity Act 2015

Biosecurity is a vital consideration for Lord Howe Island projects because the island biodiversity is extremely vulnerable to introduced biodiversity in the form of flora (weeds), fauna (pest animals) and pathogens. It has already been impacted by many such entities since the original colonisation by European settlers (some of which have been successfully eradicated).

The objects of the NSW *Biosecurity Act 2015* (Biosecurity Act) are as follows:

1. The primary object of the Biosecurity Act is to provide a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers.
2. The other objects of the Biosecurity Act are as follows:
    a. to promote biosecurity as a shared responsibility between government, industry and communities,
    b. to provide a framework for the timely and effective management of the following:
        i. pests, diseases, contaminants and other biosecurity matter that are economically significant for primary production industries,
        ii. threats to terrestrial and aquatic environments arising from pests, diseases, contaminants and other biosecurity matter,
        iii. public health and safety risks arising from contaminants, non-indigenous animals, bees, weeds and other biosecurity matter known to contribute to human health problems,
        iv. pests, diseases, contaminants and other biosecurity matter that may have an adverse effect on community activities and infrastructure,
    c. to provide a framework for risk-based decision-making in relation to biosecurity,
    d. to give effect to intergovernmental biosecurity agreements to which the State is a party,
    e. to provide the means by which biosecurity requirements in other jurisdictions can be met, so as to maintain market access for industry.

Biosecurity rules on Lord Howe Island are different to those for NSW and the Australian mainland. The LHIB along with assistance from the Department of Primary Industries and Regional Development (DPIRD) – Marine Parks and Agricultural and Biosecurity, as well as other government agencies, are responsible for the biosecurity on Lord Howe Island. The LHIB have implemented strict biosecurity measures to safe-guard Lord Howe Island from pathogens, weeds and introduced pest species. These biosecurity measures are outlined in the Lord Howe Island Biodiversity Management Plan (DECC, 2007). Current environmental programs being implemented to maintain and protect the Island's World Heritage values include the African Big-headed Ant Eradication Program, pest animal control programs, weed eradication program and environmental education programs (LHIB, 2025a).

Several invasive pests have already been removed from the island including cats, goats, pigs, and more recently Black Rats (R*attus rattus*). Other invasive pest species that occur on the island such as the Mallard x Pacific Black Duck hybrids (*Anas superciliosa* x *Anas platyrhynchos),* Feral Pigeons (*Columba livia*), Common Starling (*Sturnus vulgaris*), Blackbird (*Turdus merula*) and Masked Owl (*Tyto novaehollandiae*). Control strategies are in place for these species as they can recolonise the island (LHIB, 2025a). Biosecurity controls for the introduction of other pests such as the Cane Toad (*Bufo marinus*) are also in place and managed by the LHIB (DECC, 2007).

Invasive weeds are identified as one of the most serious threats to Lord Howe Island's biodiversity and World Heritage values. Under the Biosecurity Act all weeds are required to be controlled by all persons under a "General Biosecurity Duty". The General Biosecurity Duty means that all public and private landowners or managers and all other people who deal with weed species (biosecurity matters) must use the most appropriate approach to prevent, eliminate, or minimise the negative impact (biosecurity risk) of those weeds (DPI, 2017). Under Division 2 of the Biosecurity Act, the LHIB is the local control authority for land within Lord Howe Island. The LHIB have specific statutory obligations for the management of weeds on Lord Howe Island and in 2016 published the *Lord Howe Island Weed Management Strategy 2016-2025* (LHIB, 2016). The Strategy provides a strategic framework for the continued reduction and elimination of the threats posed by invasive weeds from 2016 to 2026.

Highly infectious plant pathogens such as Myrtle Rust (*Austropuccinia psidii*) and Phytophthora (*Phytophthora cinnamomi*) have the potential to cause irrevocable damage to the environment. The LHIB is responsible for the control and management of infectious plant pathogens and have implemented monitoring and hygiene protocols across the island, such as the installation of footwear sanitary stations at all walking track heads (LHIB, 2025b).

2.1.4. Lord Howe Island Local Environment Plan 2010

The Lord Howe Island *Local Environment Plan 2010* (Lord Howe Island LEP) is established under Part 3 of the *Environmental Planning and Assessment Act 1979,* and alongside the *Lord Howe Island Development Control Plan 2005* (Lord Howe Island DCP), controls planning and development on the Island. The ecological objectives of the Lord Howe Island LEP include:

- to conserve the World Heritage values of Lord Howe Island and to restore or enhance lost or disturbed natural resources of the Island;
- to conserve and facilitate the management of the marine environment of the Island and the resources of that environment;
- to protect threatened species, populations and ecological communities, and their habitats;
- to encourage the ecologically sustainable use of resources;
- to encourage community appreciation of the World Heritage values of the Island; and
- to identify suitable land for the provision of housing and community services for the Island's population while acknowledging suitable land for these purposes is limited.

Given the Project is being assessed as a CSSI, the provisions of the LEP do not apply to the Project. Nevertheless, the Project has been designed to meet the ecological objectives of the LEP.

2.1.5. Lord Howe Island Development Control Plan 2005

The Lord Howe Island DCP is the primary local planning instrument applicable to the study area. The key objective of the DCP is to provide controls for all development to encourage environmental sustainability and biodiversity. The DCP also provides controls to reflect best practice in the design of proposals to have a minimal impact on the World Heritage values, ecological values and amenity of the Island and its community.

Given the Project is being assessed as a CSSI, the provisions of the DCP do not apply to the Project. Nevertheless, the Project has been designed in consideration of the controls listed in the DCP.

2.2. Commonwealth Legislation

2.2.1. Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas of national significance. It also provides a mechanism for national environment protection and biodiversity conservation.

The EPBC Act is administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water (Commonwealth DCCEEW) and provides protection for listed Matters of National Environmental Significance (MNES) including:

- Listed species and communities (e.g. listed threatened species and ecological communities and migratory species);
- Protected areas (e.g. World Heritage properties, Ramsar wetlands of international significance, conservation zones); and
- National, Commonwealth and Indigenous Heritage.

Under the EPBC Act, any action (which includes a development, project or activity) that is considered likely to have a significant impact on MNES must be referred to the Commonwealth Minister for DCCEEW.

A Referral (2025/10188) was submitted to Commonwealth DCCEEW on 7 May 2025. The Referral decision (dated 7 July 2025), determined the Project to be a controlled action for potential impacts to World Heritage properties (sections 12 and 15A), National Heritage places (sections 15B and 15C), listed threatened species and communities (section 18 & 18 A) and listed migratory species (section 20 & 20A).

As per the Referral decision, the Project is to be assessed via the assessment bilateral agreement with NSW. The Referral decision also provided a list of World Heritage properties, National Heritage Places, threatened species and migratory species which require assessment. An assessment of MNES is included within this FFA as well as the Project's BDAR (our ref. 23150RP4).

2.2.2. International Treaty Obligations on Migratory Species

Australia is signatory to several agreements relating to migratory species. Migratory species listed under the following agreements and conventions are protected in Australia by being listed as MNES (Migratory Controlling Provision) under the EPBC Act:

- China–Australia Migratory Bird Agreement (CAMBA);
- Japan–Australia Migratory Bird Agreement (JAMBA);
- Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA); and
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

The CAMBA and JAMBA agreements list terrestrial, water and shorebird species which migrate between Australia and the respective countries. In both cases, the majority of listed species are shorebirds (DCCEEW, 2024).

Both agreements require the parties to protect migratory birds by:

- Limiting the circumstances under which migratory birds are taken or traded;
- Protecting and conserving important habitats;
- Exchanging information; and
- Building cooperative relationships.

The JAMBA agreement also includes provisions for cooperation on the conservation of threatened birds. Australian government and non-government representatives meet every two years with Japanese and Chinese counterparts to review progress in implementing the agreements and to explore new initiatives to conserve migratory birds (DCCEEW, 2024).

The ROKAMBA formalises Australia's relationship with the Republic of Korea in respect to migratory bird conservation and provides a basis for collaboration on the protection of migratory shorebirds and their habitat (DCCEEW, 2024).

In addition to these bilateral agreements, Australia is also a signatory of the Bonn Convention. This convention aims to conserve terrestrial, aquatic and avian migratory species throughout their range (CMS, 2025).

3. Methodology

This section provides details of the surveys undertaken in the study area (comprising the North and South Zones) and surrounds, including vegetation mapping and targeted threatened flora and fauna surveys.

3.1. Desktop Assessment

3.1.1. Database Analysis

A database analysis was conducted through interrogation of the Commonwealth Department of Climate Change, Energy, the Environment and Water (Commonwealth DCCEEW) EPBC Protected Matters Search Tool (PMST) (DCCEEW, 2025)and the NSW BioNet Atlas (DCCEEW (NSW), 2025). The EPBC PMST generated a list of potentially occurring MNES including World Heritage Properties, National Heritage Places, Threatened Ecological Communities (TECs), threatened species and migratory species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) within a 5 km radius of the study area (i.e. the locality), which fully encompassed the North and South Zones. The BioNet Atlas search facility was used to generate records of flora and fauna, (including threatened species), known to occur across Lord Howe Island. This information was used for the purposes of confirming the abundance, distribution and age of threatened flora and fauna records within the locality, and to inform an assessment of the likelihood of those threatened species to occur within the study area.

The latest map of vegetation communities from the *Lord Howe Island Vegetation Map 2016* (VIS_ID 4450), published by the LHIB and accessed from the NSW SEED Portal (NSW Government, 2024), was also consulted to review the distribution of vegetation communities within the study area including the potential presence of TECs.

3.1.2. Literature Review

Literature on the ecology of Lord Howe Island was reviewed, including data and reports published by the LHIB and other ecological studies. Key documents reviewed included:

- Department of Environment and Climate Change (NSW) 2007, *Lord Howe Island Biodiversity Management Plan*, Department of Environment and Climate Change (NSW), Sydney (DECC, 2007);
- Sheringham P., Richards P., Gilmour P., & Kemmerer E., 2016, *A Systematic Flora Survey, Floristic Classification and High-Resolution Vegetation Map of Lord Howe Island*. Lord Howe Island Board, Lord Howe Island, NSW (Sheringham *et al.*, 2016c); and
- Lord How Island Board 2016, *Lord Howe Island Weed Management Strategy 2016 – 2025*, Lord Howe Island Board, Lord Howe Island (LHIB, 2016).

3.2. Likelihood of Occurrence Assessment

The likelihood of threatened species occurring within the subject land was assessed based on the results of the database analysis and literature review using the criteria presented in **Table 2**. The assessment was based on the species known ranges, number and age of records, and habitat preferences which were considered when undertaking the desktop assessment. The likelihood of occurrence assessment is presented in **Appendix A**.

Table 2 Criteria to assess potential for threatened and/or migratory species to occur within the study area

Likelihood to Occur	Definition
Known	The species has been recorded within the study area during surveys undertaken for the Project.
High	Previous records are held within the study area, there are a high number of records from the locality and suitable habitat is present.
Moderate	A high number of records of the species occur within the locality and/or habitat may be available within the study area however it is marginal, fragmented and/or small in size, or degraded.
Low	The species is unlikely to occur due to a lack of, or limited, habitat within the study area, or extremely poor-quality habitat within the study area, or no or very few recent records of the species occurring in the wider locality.

3.3. Flora Surveys

Flora surveys were conducted by a botanist and an ecologist from Cumberland Ecology within the South Zone between 8-12 July 2024 and within the North Zone between the 8-10 December 2024. The flora surveys included vegetation mapping, floristic plot surveys and targeted threatened species searches. The flora survey methods are described below and flora survey locations for the North and South Zone are shown in **Figure 4** and **Figure 5**, respectively.

3.3.1. Vegetation Mapping

The vegetation within the study area was ground-truthed to examine and verify the mapping of the condition and extent of the different vegetation communities. Mapping of vegetation communities within the study area was undertaken by traversing each patch of vegetation, noting key characteristics of areas in similar broad condition states such as similar tree cover, shrub cover, ground cover, weediness or a combination of these.

Records of vegetation community boundaries were made using a hand-held Global Positioning System unit and mark-up of aerial photographs. Following the completion of the surveys, the resultant information was synthesised using Geographical Information Systems to create a spatial database that was used to interpret and interpolate the data to produce a vegetation map of the study area. Vegetation communities were aligned to the communities defined in the 2016 floristic study (Sheringham et al. 2016). Photographs were taken of the vegetation present to provide a visual documentation of types and condition of vegetation communities occurring within the study area, which is discussed further in ***Section 4.1***.

In mainland NSW vegetation communities are all typed and mapped as what is known as plant community types (PCTs). For each such PCT, baseline information is stored and retrievable to inform environmental impact assessments, particularly those under the BC Act. Hower, on Lord Howe Island, no PCT classifications have been created by the State. Therefore the vegetation communities identified within the 2016 floristic study (Sheringham et al. 2016) have not currently been incorporated into the NSW Vegetation Classification System and subsequently have not been assigned to plant community types.

3.3.2. Floristic Plots

Sixteen floristic plots, including five plots within the North Zone and eleven plots within the South Zone, were undertaken within the study area and immediately adjacent areas in accordance with the Biodiversity Assessment Method (BAM). Although the BAM cannot be formally applied to assess biodiversity values on Lord Howe Island because PCTs are not yet created there, the methods used for BAM plots align with the plot surveys undertaken in the 2016 floristic study which used 20 x 20m plots and therefore the data was suitable for verifying the vegetation communities identified.

The floristic plot sampling included the establishment of a 20 x 50 m plot, within which the following data was collected:

- Composition for each growth form group by counting the number of native plant species recorded for each growth form group within a 20 x 20 m plot;
- Structure of each growth form group as the sum of all the individual projected foliage cover estimates of all native plant species recorded within each growth form group within a 20 x 20 m plot;
- Cover of High Threat Exotic weed species within a 20 x 20 m plot;
- Assessment of function attributes within a 20 x 50 m plot, including:
    - Count of number of large trees;
    - Tree stem size classes, measured as 'diameter at breast height over bark' (DBH);
    - Regeneration based on the presence of living trees with stems <5cm DBH; and
    - The total length in metres of fallen logs over 10 cm in diameter.
- Assessment of litter cover within five 1 m x 1 m plots evenly spread within the 20 x 50 m plot; and
- Number of trees with hollows that are visible from the ground within the 20 x 50 m plot.

3.3.3. Targeted Threatened Flora Surveys

Targeted threatened flora surveys were undertaken within the study area for flora species listed under the BC Act and/or EPBC Act that were previously recorded within the locality of the study area and/or determined to have potential to occur based on the mapped vegetation communities. Although surveys were primarily focused on two species, Knicker Nut (*Caesalpinia bonduc*) and Sand Spurge (*Chamaesyce psammogeton*) which are considered to have a moderate likelihood of occurrence, all threatened flora species previously recorded within the locality were considered during targeted threatened flora surveys given the small number of species overall. Details of the survey methods and a summary of the survey effort conducted for threatened flora species within the study area is provided below.

3.3.3.1. Random Meander

*Target Species: As listed **Table 3** below.*

Targeted threatened flora searches using random meanders was incorporated into the vegetation mapping and plot surveys during the July and December 2024 surveys.

3.3.3.2. Parallel Traverses

*Target Species: As listed in **Table 3** below.*

Targeted surveys were conducted using parallel field traverses in combination with the random meander in accordance with the NSW Guide to Surveying Threatened Plants (NSW Government 2020). Targeted threatened flora surveys using parallel traverses were undertaken within the South Zone in July 2024 and the North Zone in December 2024.

Table 3 Threatened flora species surveyed for in the study area

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Dates of Survey	Survey Method
Anthosachne kingiana subsp. *kingiana*	Phillip Island Wheat Grass	CE	CE	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Caesalpinia bonduc	Knicker Nut	E	-	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Calystegia affinis	Lord Howe Island Morning Glory	CE	CE	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Carmichaelia exsul	Lord Howe Island Broom	CE	-	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Chamaesyce psammogeton	Sand Spurge	E	-	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Coprosma inopinata	Small-leaved Currant Bush	E	-	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Geniostoma huttonii	Hutton's Geniostoma	E	E	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Hypolepis elegans	(blank)	CE	-	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Lepidorrhachis mooreana	Little Mountain Palm	CE	CE	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses
Polystichum moorei	Rock Shield Fern	E	E	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Dates of Survey	Survey Method
Xylosma parvifolia	Mountain Xylosma	E	E	8 – 12 July 2024, 8 – 10 December 2024	Random meander, plot survey, parallel traverses

E=Endangered, CE=Critically Endangered

3.4. Fauna Surveys

Fauna surveys were undertaken within the study area as well as other areas of similar habitat on Lord Howe Island. Surveys undertaken beyond the study area were undertaken to provide context and assess the occurrence and potential distribution of the Lord Howe Placostylus following initial detections of the species within the South Zone in July 2024.

The fauna surveys included a habitat assessment and targeted threatened/migratory species surveys. These survey methods are described below while the fauna survey locations are shown in **Figure 6**.

3.4.1. Habitat Assessment

A fauna habitat assessment was conducted by an ecologist within the South Zone between the 8-12 July 2024 and within the North Zone between the 9-15 December 2024. The nature and extent of fauna habitats in the study area were assessed and areas where fauna species could reside or forage were identified. Habitat features including but not limited to hollow-bearing trees, nests, logs and woody debris, and artificial structures throughout the study area were recorded.

During this habitat assessment any fauna seen, heard or otherwise determined to be present from signs of fauna use were recorded.

3.4.2. Targeted Threatened and Migratory Fauna Surveys

Targeted threatened and migratory fauna surveys were undertaken within the study area for fauna species listed under the BC Act and EPBC Act that were previously recorded within the locality of the study area and/or determined to have potential to occur based on the available habitat. This includes all species identified within **Appendix A** that have a moderate or high likelihood of occurrence or are known to occur within the study area.

Details of each of the targeted threatened/migratory species surveys is provided below while a summary of the survey effort conducted for the threatened and/or migratory fauna species within the study area is provided in **Table 4**.

The recommended survey periods for threatened species listed under the BC Act are listed in the TBDC, while the recommended survey periods for threatened and/or migratory species listed under the EPBC Act are published under several different sources, including, but not limited to:

- Commonwealth DCCEEW Species Profile and Threats Database (DCCEEW (Cwlth), 2025);
- Conservation Advice published by the Threatened Species Scientific Committee;
- Threatened Biodiversity Survey and Assessment Guidelines for Development and Activities (Working Draft)(DEC (NSW), 2004);
- Survey guidelines for Australia's threatened birds (DEWHA, 2010);
- Survey guidelines for Australia's threatened reptiles (DotE, 2011);

- Handbook of Australian, New Zealand & Antarctic Birds (HANZAB) Online; and
- Appendix 5 of the Lord Howe Island Biodiversity Management Plan (DECC, 2007).

The survey effort for migratory shorebirds is identified within the *Industry Guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebirds* published by the former Commonwealth Department of the Environment and Energy (DoEE, 2017). These guidelines state that the survey effort for migratory shorebirds is ideally comprised of four replicate surveys conducted during months when the majority of migratory shorebirds are present in the area, in most cases involving one survey in December, two surveys in January and one survey in February.

Table 4 Threatened/migratory fauna species surveyed for in the study area and surrounds

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period[1]	Dates of Survey	Survey Method
Birds						
Actitis hypoleucos	Common Sandpiper	-	M	Aug – Feb	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Anous stolidus	Common Noddy	-	M	Sep – May	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Ardenna carneipes	Flesh-footed Shearwater	V	M	Sep – May	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Ardenna pacifica	Wedge-tailed Shearwater	-	M	Sep – May	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Arenaria interpres	Ruddy Turnstone	V	V, M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Calidris acuminata	Sharp-tailed Sandpiper	-	V, M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period[1]	Dates of Survey	Survey Method
Calidris canutus	Red Knot	-	V, M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Calidris ferruginea	Curlew Sandpiper	E	CE, M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Calidris melanotos	Pectoral Sandpiper	-	M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Calidris ruficollis	Red-necked Stint	-	M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Charadrius bicinctus	Double-banded Plover	-	M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Charadrius veredus	Oriental Plover	-	M	Sep – May	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Chlidonias leucopterus	White-winged Black Tern	-	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period[1]	Dates of Survey	Survey Method
Fregetta grallaria	White-bellied Storm-Petrel	V	V	Sep – Feb	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Gallinago hardwickii	Latham's Snipe	-	M	Oct – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Gygis alba	White Tern	V	-	Sep – May	8-12 July 2024, 11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Hydroprogne caspia	Caspian Tern	-	M	Jan – Dec	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Hypotaenidia sylvestris	Lord Howe Woodhen	E	E	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Limosa lapponica baueri	Bar-tailed Godwit	E	E, M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Numenius madagascariensis	Eastern Curlew	-	CE, M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period[1]	Dates of Survey	Survey Method
Numenius minutus	Little Curlew	-	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Numenius phaeopus	Whimbrel	-	M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Onychoprion fuscata	Sooty Tern	V	-	Aug – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Pachycephala pectoralis contempta	Golden Whistler (Lord Howe Is. subsp.)	V	-	Jan – Dec	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Pluvialis fulva	Pacific Golden Plover	-	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Pterodroma nigripennis	Black-winged Petrel	V	-	Oct – May	8-12 July 2024, 11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Strepera graculina crissalis	Pied Currawong (Lord Howe Is. subsp.)	V	V	Jan – Dec	8-12 July 2024, 11-16 December 2024, 14-17 January 2025,	Bird Surveys (Area and Point surveys), opportunistic sightings

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period[1]	Dates of Survey	Survey Method
					15-18 February 2025	
Sula dactylatra	Masked Booby	V	M	Jan – Dec	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Tringa brevipes	Grey-tailed Tattler	-	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Tringa incana	Wandering Tattler	-	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Tringa nebularia	Common Greenshank	-	M	Sep – Mar	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Tringa stagnatilis	Marsh Sandpiper	-	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Xenus cinereus	Terek Sandpiper	V	M	Sep – Apr	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings
Zosterops lateralis tephropleurus	Silvereye (Lord Howe Is. subsp.)	V	-	Jan – Dec	11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Bird Surveys (Area and Point surveys), opportunistic sightings

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Recommended Survey Period[1]	Dates of Survey	Survey Method
Reptiles						
Christinus guentheri	Lord Howe Island Gecko	V	V	Nov – Feb	11-16 December 2024	Funnel trapping, spotlighting
Oligosoma lichenigera	Lord Howe Island Skink	V	V	Nov – Feb	11-16 December 2024	Pitfall trapping, funnel trapping, diurnal active searches
Snails						
Placostylus bivaricosus	Lord Howe Placostylus	E	E	Jan – Dec	9-11 July 2024, 11-16 December 2024, 14-17 January 2025, 15-18 February 2025	Spotlighting

[1] Recommended survey periods have been determined based on a review of the TBDC as well as other Commonwealth guidelines.

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

3.4.2.1. Bird Surveys – Area Searches

*Target Species: All birds listed in **Table 4** above.*

Area searches were undertaken across four sites within the study area, including two sites within the North Zone and two sites within the South Zone. Area searches were undertaken by a team of two ecologists for a 20 min period at each site, sampling approximately 1 ha. Each site was searched systematically, while stopping or moving to investigate sightings and/or calls. Area searches were undertaken across four survey periods between 8-12 July 2024, 11-16 December 2024, 14-17 January 2025 and 15-18 February 2025.

Area searches were predominantly undertaken within habitats that were comprised of denser vegetation, allowing observers more flexibility and movement to explore signs of presence and thoroughly search each site. These were supplemented by point surveys as described in ***Section 3.4.2.2***.

3.4.2.2. Bird Surveys – Point Survey

*Target Species: All birds listed in **Table 4** above.*

Point surveys were undertaken across four sites within the study area, including two sites within the North Zone and two sites within the South Zone. Sites selected for point surveys were located along the foreshore, where observers had clear vantage points of birds present within each site. Point surveys were undertaken by a team of two ecologists for a 20 min period at each site over a minimum of four consecutive days. Point surveys were undertaken over three survey periods between 11-16 December 2024, 14-17 January 2025 and 15-18 February 2025.

3.4.2.3. Migratory Shorebird Surveys

Target Species: Bar-tailed Godwit, Black-tailed Godwit, Common Greenshank, Common Sandpiper, Curlew Sandpiper, Eastern Curlew, Greater Sand Plover, Latham's Sipe, Little Curlew, Marsh Sandpiper, Pacific Golden Plover, Pectoral Sandpiper, Red Knot, Red-necked Stint, Ruddy Turnstone, Sharp-tailed Sandpiper, Terek Sandpiper, Whimbrel.

Migratory shorebird surveys were undertaken using a combination of area searches and point surveys as per the methods described above. Migratory shorebird surveys were undertaken with reference to the '*Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species' ((Commonwealth of Australia 2017))*. Surveys were undertaken across three survey periods, one from 11-16 December 2024, one from 14-17 January 2025 and one from 15-18 February 2025, which were during the months when shorebirds are considered most likely to be present within the study area. A fourth survey was not considered to be warranted given the results of the three surveys undertaken, as well as the condition of habitat within the study area and consultation with the Ranger from the LHIB who indicated that it was unlikely that additional species would rely on the habitat within the study area beyond those already identified.

Surveys were undertaken during both high and low tides to survey for both roosting and foraging shorebirds and were repeated over a minimum of four days during each survey period. During surveys the following was recorded:

- Date, time of day;

- Tide height;
- General weather conditions;
- Observer names;
- Habitat description;
- Species present;
- Species abundance; and
- Species behaviour (i.e. roosting/foraging).

3.4.2.4. Pitfall Traps

Target Species: Lord Howe Island Skink.

Pitfall traps were established within the study area in areas comprised of dense litter which offer suitable foraging and shelter habitat. Furthermore, one site within the North Zone as well as one representative site beyond the study area were surveyed given the presence of calcarenite rock, also known to be favoured by the species for shelter. Pitfall traps were set for five nights in December 2024. Six trap lines were established along transects, comprising six 10 litre buckets dug into the ground and 20 m of drift fencing set between each bucket along the trap line. Leaf litter and small twigs were placed in the bottom of each bucket to provide shelter for trapped animals. Traps were checked each morning within two hours of sunrise and again each afternoon within two hours of sunset.

Of the six trap lines established, two were located within the North Zone, three within the South Zone and one was located within a reference site within Steven's Reserve that comprised similar habitat to that within the North and South Zones.

3.4.2.5. Funnel Traps

Target Species: Lord Howe Island Skink, Lord Howe Island Gecko.

Funnel trapping was undertaken in conjunction with pitfall trapping. At each transect four funnel traps were evenly distributed along the drift fencing (two on either side of the drift fence) at approximately 4-5m intervals. Funnel traps were set in shaded areas where possible, however additional cover using fronds and litter were placed over the funnel traps to provide shading as required. Funnel traps were set for five nights and checked each morning within 2 hours of sunrise and again each afternoon within two hours of sunset. Any fauna captured was identified and released.

3.4.2.6. Diurnal Active Searches

Target Species: Lord Howe Island Skink.

Diurnal active searches were undertaken opportunistically within the study area from 11-16 December 2024, 14-17 January 2025 and 15-18 February 2025. Diurnal active searches predominantly involved searches under boats and canoes that had been left along the grassy banks within the study area. Where possible, rocks were

also turned over to search for the species, along with other material that had been left/dumped such as pieces of wood. When turning rocks, care was taken when replacing turned items to maintain the seal between the item and ground.

3.4.2.7. Spotlighting

Target Species: Lord Howe Island Gecko, Lord Howe Island Skink, Lord Howe Placostylus

Spotlighting was undertaken via a random meander throughout the study area using high powered hand-held torches, focusing on the potential for presence of the target species. Searches for the Lord Howe Island Skink and Lord Howe Island Gecko involved searches of cavities within calcarenite rock and tree trunks, while searches for the Lord Howe Placostylus involved searches for live snails on the ground amongst the leaf litter. Where possible, searches for the Lord Howe Island Placostylus were undertaken during rainfall events and in the days post rainfall. Spotlighting searches were undertaken across the study area for approximately four hours each night by two ecologists. A total of 11 nights of survey were undertaken, including two nights in July 2024, five nights in December 2024, two nights in January 2025 and two nights in February 2025. It is noted that the spotlighting surveys undertaken within the July 2024, and the January and February 2025 survey periods, were undertaken opportunistically following rainfall events which increased the probability of detecting the Lord Howe Placostylus.

Additional spotlighting surveys were undertaken during the December 2024 survey period in accessible areas outside of the study area that comprised similar habitat to the study area. Sites comprising similar vegetation communities around local community areas were identified during the desktop assessment and subject to surveys. Sites were surveyed for a minimum of two nights, unless they were deemed to be unsuitable based on an assessment of habitat during surveys. These additional surveys were undertaken to assess the occurrence of the target species on a broader landscape scale.

3.5. Weather Conditions

Surveys were undertaken in July and December 2024 and January and February 2025. Weather conditions during surveys were considered suitable for the detection of target species. A monthly summary of weather conditions in the wider locality of the study area (Bureau of Meteorology Weather Station 200839 – Lord Howe Island, NSW) leading up to and during the field surveys is provided in **Table 5** (Bureau of Meteorology, 2025).

Table 5 Weather conditions during field surveys

Date	Temperature Minimum (°C)	Temperature Maximum (°C)	Rainfall (mm)
Proceeding Months*			
April 2024	18.4	24.2	254.4
May 2024	16.1	21.6	104.4
June 2024	15.1	21.0	166.0
September 2024	15.6	21.3	116.7
October 2024	15.8	21.5	134.6
November 2024	18.9	23.7	188.4

Date	Temperature Minimum (°C)	Temperature Maximum (°C)	Rainfall (mm)
During Surveys			
July 2024			
08/07/2024	14.9	19.5	6.4
09/07/2024	16.1	20.3	0.2
10/07/2024	18.6	20.9	0.0
11/07/2024	17.3	20.1	9.8
12/07/2024	16.9	20.5	17.2
13/07/2024	17.0	21.4	53.6
December 2024			
11/12/2024	20.2	25.5	25.2
12/12/2024	16.5	24.9	0.0
13/12/2024	19.3	26.0	0.0
14/12/2024	22.3	26.0	5.6
15/12/2024	22.5	26.3	0.0
16/12/2024	23.2	26.2	0.6
January 2025			
14/01/2025	20.2	26.2	1.2
15/01/2025	21.2	26.2	1.6
16/01/2025	22.5	26.9	0.0
17/01/2025	21.9	26.7	0.6
February 2025			
15/02/2025	20.8	26.2	7.4
16/02/2025	21.8	28.7	0.0
17/02/2025	21.2	24.9	9.0
18/02/2025	19.1	24.7	1.8

** For preceding months values, temperatures are provided as a mean value, and rainfall is provided as a total.*

3.6. Limitations

Vertebrate fauna and vascular flora of the locality are relatively well known based upon a sizeable database of past records. The surveys by SLR Consulting added to the existing database and helped to provide a clear indication of the likelihood that various species occur, or are likely to occur, within the subject land. The data obtained from database assessment and surveys of the study area furnished an appropriate level of information to support this assessment.

Given the restrictions on guests of Lord Howe Island, timing for field surveys was somewhat limited by flight and accommodation availabilities. Therefore, once surveys were scheduled, minor adjustments could not be made based on predicted or current weather events. Nevertheless, the weather conditions at the times of the

flora surveys were generally favourable for plant growth and production of features required for identification of most species. Shrubs, grasses, herbs and creepers were readily identifiable in most instances. It is expected that not all flora species present would have been recorded during surveys. Despite this, it is considered that sufficient information has been collected to assess issues including conservation significance of the flora, condition and viability of bushland and likely impact on native vegetation. An assessment of the likelihood of occurrence of threatened flora species recorded within the locality of the Subject Site in the database searches was undertaken to supplement the flora survey.

Furthermore, the weather conditions at the time of the fauna surveys were generally favourable to detect target species. However, threatened snails such as the Lord Howe Placostylus, are typically more active during periods of wet weather. While some rainfall was received during targeted surveys, particularly in July 2024, this was relatively brief and limited to a single night or a couple of nights and not the entire survey period. Therefore, the chances of detecting threatened snails were higher during these periods and lower during dry conditions. Nevertheless, the surveys undertaken were considered suitable to determine the species occurrence within the study area.

Another limitation of the survey work is that the work took place within a 12-month period, and there is a possibility of different conditions between years. This has been addressed by making detailed use of previous survey results at other parts of the island.

It is also important to recognise that the island biota has been greatly impacted over the years by feral animals, particularly pigs, goats and black rats (*Rattus rattus*), which have all been removed from the island. In the case of black rats, an island-wide eradication commenced in 2019. Since July 2023, there has been no signs of rodents on Lord Howe Island and there are already signs of substantial recovery of many species of wildlife such as the Lord Howe Island Woodhen.

Historically, the lowlands of Lord Howe Island have suffered the greatest ecological impacts post human settlement and this is where the North and South Zones are located. The result is that much of the lowland habitat for many species has been fragmented and degraded. After the eradication of black rats, is it likely that ecological recovery is continuing. For this reason, the current surveys for threatened species provide a snapshot in what could be a continuum of recovery. In years to come, there may be greater numbers of various native plant and animal species as a result of the eradication program. For this reason, this FFA has taken a conservative approach to assessing the likelihood of occurrence for threatened and migratory species.

This FFA focused on terrestrial species of animals (mainly vertebrates) and plants (mainly vascular plants) that are known to occur on Lord Howe Island. Amongst the invertebrates, only molluscs and one insect (Lord Howe Island Phasmid) are threatened. Notwithstanding that, there is potential for other invertebrate animals to occur and to be of conservation significance. Such potential species have been little-studied and have not been assessed by this investigation. Notwithstanding that, they have been accounted for on the assumption that such invertebrate fauna, if restricted to the island or rare, are likely to be associated with native vegetation. So, to a degree, consideration of native vegetation is assumed to provide a surrogate for consideration of invertebrate biodiversity.

4. Results

This chapter provides an overview of the flora of the study area and surrounds, including information on vegetation communities, general flora and fauna species and threatened species.

4.1. Vegetation Communities

Several areas within the study area have shown evidence of recent regeneration which has resulted in redefining the boundaries of the vegetation communities present. The ten native vegetation communities and their conditions within the subject land are summarised in **Table 6**.

The distribution of vegetation communities within the study area is provided in **Figure 7** (North Zone) and **Figure 8** (South Zone). Descriptions of the vegetation communities present within the study area including their formation and class in accordance with the 2016 floristic study (Sheringham et al. 2016) are provided in subsequent sections. It is noted that one species, *Melanthera biflora* has been subject to a name change and is now known as *Wollastonia uniflora*. However, to maintain consistency with the vegetation descriptions provided in the 2016 floristic study, this report has referred to the species as *Melanthera biflora*.

Table 6 Vegetation communities and approximate areas within the study area

Community #	Vegetation Community	BC Act Status	EPBC Act Status	Study Area			Subject Land		
				North Zone	South Zone	Total	North Zone	South Zone	Total
1	Coastal Spinifex - Dune Bean - Club Rush - Melanthera biflora - Saltwater Couch beach strandline grassland	-	-	0.00	1.31	1.31	0.00	0.26	0.26
2	Melanthera biflora - Saltwater Couch herbland/grassland on coral boulder beaches and rocky headlands	-	-	0.23	0.00	0.23	0.01	0.00	0.01
6	Sallywood swamp forest of poorly drained, low-lying areas	CEEC	CEEC	0.00	0.03	0.03	0.00	0.00	0.00
8	Bully Bush - Hopwood shrubland on shallow rocky soils		-	0.18	0.64	0.82	0.04	0.06	0.10
12a	Kentia Palm Forest on coral sand and calcarenite		-	0.07	1.14	1.20	0.01	0.17	0.18
12b	Banyan - Kentia Palm forest on coral sand and calcarenite		-	0.14	0.00	0.14	0.00	0.00	0.00
12a/Ex	Kentia Palm Forest on coral sand and calcarenite with emergent *Araucaria heterophylla*		-	0.26	0.00	0.26	0.02	0.00	0.02
17a	Greybark - Blackbutt rainforest		-	0.00	1.80	1.80	0.00	0.13	0.13
17b	Greybark - Blackbutt low closed forest on exposed basalt slopes		-	0.00	0.01	0.01	0.00	0.00	0.00
21	River Mangrove tall shrubland of brackish creeks		-	0.00	0.06	0.06	0.00	0.00	0.00
Ep	Environmental plantings		-	0.00	0.43	0.43	0.00	0.002	0.00
Np	Plantation			0.26	0.13	0.39	0.05	0.00	0.05

Community #	Vegetation Community	BC Act Status	EPBC Act Status	Study Area			Subject Land		
				North Zone	South Zone	Total	North Zone	South Zone	Total
Ex	Exotic Vegetation		-	0.50	7.11	7.60	0.33	1.48	1.81
Beach	Sand/Boulder Beach			1.13	1.07	2.19	0.34	0.01	0.34
Cl	Cleared land		-	0.49	1.74	2.23	0.38	1.08	1.46
Water	Water			1.00	0.00	1.00	0.89	0.00	0.89
Total				**4.24**	**15.46**	**19.70**	**2.08**	**3.18**	**5.26**

CEEC = Critically Endangered Ecological Community

4.1.1. Coastal Spinifex - Dune Bean - Club Rush - Melanthera biflora - Saltwater Couch beach strandline grassland

Community #: 1

Scientific Name: *Spinifex sericeus – Vigna marina – Ficinia nodosa – Melanthera biflora – Sporobolus virginicus var. virginicus*

Vegetation Formation: Grasslands

Vegetation Class: Maritime Grasslands

Status: Not listed

This community is known to occur on unconsolidated calcareous beach dunes, such as those at North Bay, Old Settlement, Ned's, Blinky and Lagoon beaches (Sheringham et al. 2016). Within the study area this community is restricted to the South Zone, where it occurs as a low, dense grassland or sedgeland running parallel to Lagoon Beach. There are gradual transitions in weed abundance across the community. Common ground layer species are *Spinifex sericeus* (Hairy Spinifex), *Vigna marina* (Dune Bean), *Ficinia nodosa* (Knobby Club-rush), *Melanthera biflora*, *Sporobolus virginicus* (Sand Couch) and *Tylophora biglandulosa*. Scattered emergent shrubs of *Cassinia tenuifolia* (Bully Bush) are also present. Exotic species are dominant within more disturbed areas of the community and include the grasses *Stenotaphrum secundatum* (Buffalo Grass), *Cenchrus clandestinus* (Kikuyu), *Ehrharta erecta* (Panic Veldtgrass) and *Bromus catharticus* (Prairie Grass) as well as herbs *Euphorbia cyathophora* (Painted Spurge), *Euphorbia paralias* (Sea Spurge), *Hydrocotyle bonariensis* (Largeleaf Pennywort) and *Cakile edentula* (American Sea Rocket).

One threatened flora species, *Chamaesyce psammogeton* (Sand Purge), known to occur on Lord Howe Island is associated with this community however was not recorded within the study area.

Examples of the community within the study area are shown in **Photograph 1** and **Photograph 2**.

Photograph 1 Coastal Spinifex – Dune Bean – Club Rush – Melanthera biflora – Saltwater Couch beach strandline grassland within the study area with low cover of introduced grasses

Photograph 2 Low condition Coastal Spinifex – Dune Bean – Club Rush – Melanthera biflora – Saltwater Couch beach strandline grassland within the study area with high cover of introduced grasses

4.1.2. *Melanthera biflora* - Saltwater Couch herbland/grassland on coral boulder beaches and rocky headlands

Community #: 2

Scientific Name: *Melanthera biflora – Sporobolus virginicus* var. *virginicus – Canavalia rosea*

Vegetation Formation: Grasslands

Vegetation Class: Maritime Grasslands

Status: Not listed

This community occurs on rocky calcarenite flats in near coastal areas exposed to the ocean, or occasionally on basalt slopes, mainly in the northern half of the island (Sheringham et al. 2016). Within the study area it is restricted to the North Zone where it occurs on steep calcarenite slopes and cliffs adjacent to the ocean. This community is dominated by the introduced grasses *Cenchrus clandestinus* (Kikuyu) and *Stenotaphrum secundatum* (Buffalo Grass). Native species present in the ground layer include *Melanthera biflora*, *Sporobolus virginicus* (Sand Couch), *Spinifex sericeus* (Hairy Spinifex) and *Ficinia nodosa* (Knobby Club-rush). Scattered emergent shrubs of *Cassinia tenuifolia* (Bully Bush), *Melaleuca howeana* (Tea Tree), and *Ochrosia elliptica* are also present. In addition to the dominant grasses, other exotic species present include *Ipomoea cairica* (Coastal Morning Glory), *Ehrharta erecta* (Panic Veldtgrass), *Bromus catharticus* (Prairie Grass), *Hydrocotyle bonariensis* (Largeleaf Pennywort) and *Cakile edentula* (American Sea Rocket).

An example of the community within the study area is shown in **Photograph 3**.

Photograph 3 Saltwater Couch herbland/grassland on coral boulder beaches and rocky headlands growing on calcarenite within the North Zone.

4.1.3. Sallywood swamp forest of poorly drained, low-lying areas

Community #: 6

Scientific Name: *Lagunaria patersonia subsp. patersonia / Aegiceras corniculata – Hibiscus tiliaceus – Myoporum insulare / Commelina cyanea*

Vegetation Formation: Forested Wetlands

Vegetation Class: Coastal Swamp Forests

Status: CEEC BC Act.

This community is restricted to a small estuarine area of moist alluvium along the banks of Cobbys Creek bordering sand dunes in the southern portion of the South Zone. This community has been mapped as a minor extension of the community previously mapped on Cobbys Creek to the east of Lagoon Road (Sheringham et al. 2016). It occurs on the creek bank adjacent to mangroves (Community 21) and to Kentia Palm Greybark Rainforest (Community 18) in adjacent areas.

Within the study area this community occurs as a closed forest. The dominant trees include *Lagunaria patersonia* (Norfolk Island Hibiscus) with occasional *Hibiscus tiliaceus* (Cottonwood Hibiscus) and *Ficus macrophylla* subsp. *columnaris* (Banyan). A sparse mid-layer of *Aegiceras corniculatum* (River Mangrove) and

Myoporum insulare (Common Boobialla) is present. The ground layer is sparse and comprises *Commelina cyanea* (Blue Wandering Jew) and *Oplismenus imbecillis*.

An example of the community within the study area is shown in **Photograph 4**.

Photograph 4 Sallywood swamp forest within the study area

4.1.4. Bully Bush – Hopwood shrubland on shallow rocky soils

Community #: 8

Scientific Name: *Lagunaria patersonia subsp. patersonia – Drypetes deplanchei / Cassinia tenuifolia – Dodonaea viscosa subsp. burmanniana – Melaleuca howeana / Muehlenbeckia complexa / Ficinia nodosa – Sporobolus virginicus var. virginicus – Poa poiformis*

Vegetation Formation: Heathlands

Vegetation Class: Coastal Headland Heaths

Status: Not listed

On Lord Howe Island, this community is typically located on steep slopes below cliffs, rocky ridges and regenerating landslips with shallow soils derived from basalt and breccia.

Within the study area this community occurs as a low-mid closed shrubland with a sparse, emergent upper layer of *Drypetes deplanchei* (Greybark), *Lagunaria patersonia* subsp. *patersonia* (Sallywood), *Hibiscus tiliaceus* (Cottonwood Hibiscus) and *Cryptocarya triplinervis var. triplinervis* (Blackbutt) with the occasional *Howea*

forsteriana (Kentia Palm). It occurs on coastal sand dunes in exposed areas adjacent to Community 1 (in the South Zone) or on exposed calcarenite adjacent to Community 2 (in the North Zone) where it occurs in a narrow strip. In the South Zone there is an open to dense shrub layer dominated by *Cassinia tenuifolia* (Bully Bush), *Dodonaea viscosa* subsp. *burmanniana* (Hopwood) and *Melaleuca howeana* (Tea Tree). Other scattered shrubs within the community include *Alyxia ruscifolia* (Prickly Alyxia), *Leucopogon parviflorus* (Coastal Beard-heath) and *Ochrosia elliptica* (Red Berrywood). The vine *Jasminum didymum* subsp. *didymum* is also present scrambling through shrubs. Within the ground layer, the dominant species include *Vigna marina* (Dune Bean), *Ficinia nodosa* (Knobby Club-rush), *Euchiton involucratus* (Star Cudweed) and *Melanthera biflora*.

In the North Zone, Community 8 forms an open to dense shrub layer dominated by *Cassinia tenuifolia* (Bully Bush) and *Melaleuca howeana* (Tea Tree) and in places *Atriplex cinerea* (Grey Saltbush). Scattered emergents of *Howea forsteriana* (Kentia Palm), *Lagunaria patersonia* subsp. *patersonia* (Sallywood), *Cryptocarya triplinervis var. triplinervis* (Blackbutt) and *Ficus macrophylla* ssp. *columnaris* are present. Vines are present, climbing over the shrubs and include *Stephania japonica*, *Jasminum didymum* subsp. *didymium, Tylophora biglandulosa*, and the introduced *Ipomoea cairica* (Coastal Morning Glory).

There is some variation in shrub density, with sparser shrubland located in more exposed areas where gaps between shrubs are dominated by ground layer species of Community 1 and 2 in transitional areas. In more protected areas dense shrubs are dominant. Areas with a more open shrubland also comprise a higher density of exotic species compared to other areas of the community.

Several exotic ground layer species are also present within Community 8, including *Stenotaphrum secundatum* (Buffalo Grass), *Cenchrus clandestinus* (Kikuyu), *Ehrharta erecta* (Panic Veldtgrass), *Conyza parva* (Fleabane), *Solanum nigrum* (Black-berry Nightshade), *Hypochoeris radicata* (Cat's Ear) *Sonchus oleraceus* (Common Sowthistle) and *Hydrocotyle bonariensis* (Large-leaved Pennywort).

Examples of the community within the study area are shown in **Photograph 5, Photograph 6** and **Photograph 7**.

Photograph 5 Open shrubland of Bully Bush – Hopwood shrubland (South Zone)

Photograph 6 Dense shrubland of Bully Bush – Hopwood shrubland (South Zone)

Photograph 7 Bully Bush – Hopwood shrubland forming a narrow strip within the North Zone)

4.1.5. Kentia Palm – Banyan forest on sand or calcarenite of coastal lowlands

Community #: 12a, 12b

Scientific Name: *Ficus macrophylla subsp. columnaris / Howea forsteriana / Asplenium milnei*

Vegetation Formation: Rainforests

Vegetation Class: Oceanic Rainforests

Status: Not listed

On Lord Howe Island this community has been divided into two variants, including 12a – Kentia Palm Forest on coral sand and calcarenite, and 12b – Banyan - Kentia Palm Forest on coral sand and calcarenite. Both of these variants have been mapped within the study area. A third variant, although not mapped by Sheringham et al. 2016, consists of an emergent layer of *Araucaria heterophylla* (Norfolk Island Pine).

4.1.5.1. Variant 12a: Kentia Palm Forest on Coral Sand and Calcarenite

Within the study area, this community occurs in both the North and South zones. It occurs as a mid-high closed forest dominated by *Howea forsteriana* (Kentia Palm) with rare emergent *Ficus macrophylla* subsp. *columnaris* (Banyan). Other tree species sparsely scattered within the community include *Drypetes deplanchei* (Greybark), *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt), *Celtis conferta* subsp. *amblyphylla* (Cotton-wood), *Elaeodendron curtipendulum* (Tamana) and *Lagunaria patersonia* (Norfolk Island Hibiscus).

The mid and lower layers of the community are predominantly represented by different aged cohorts of Kentia Palm. The ground is densely covered by fallen palm fronds however, shrubs species such as *Cassinia tenuifolia* (Bully Bush), *Myoporum insulare* (Common Boobialla) and *Ochrosia elliptica* (Red Berrywood) are present, although typically in low abundance. Other species scattered within the understorey include *Ficinia nodosa* (Knobby Club-rush), *Commelina cyanea* (Native Wandering Jew), *Jasminum didymum* subsp. *didymum, Crinum pedunculatum* (Swamp Lily), *Geitonoplesium cymosum* (Scrambling Lily) and *Smilax australis* (Lawyer Vine).

Several exotic species are also present within the community, although typically adjacent to exotic vegetation and cleared areas around the periphery of the community. Dominant exotic species include *Ehrharta erecta* (Panic Veldtgrass), *Sporobolus africanus* (Parramatta Grass), *Hydrocotyle bonariensis*, *Hypochaeris radicata* (Catsear), *Conyza parva* (Fleabane) and *Euphorbia peplus* (Petty Spurge). In places this community is regenerating following the removal of introduced *Araucaria heterophylla* (Norfolk Island Pine) trees, and these regrowth areas are generally more open, and have a greater abundance of exotic weeds.

An example of the community within the study area is shown in **Photograph 8**.

Photograph 8 Variant 12a Kentia Palm – Banyan Forest on coral sand and calcarenite within the study area

4.1.5.2. Variant 12b: Banyan – Kentia Palm Forest on Coral Sand and Calcarenite

Variant 12b is restricted to the far north of the North Zone where it is restricted to a steep slope on calcarenite, where there is extensive exposed calcarenite. This variant has an emergent layer of *Ficus macrophylla* ssp. *columnaris* over a canopy dominated by *Howea forsteriana* (Kentia Palm). Other species present in the canopy, but not dominant, include *Drypetes deplanchei* (Greybark), *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt), *Celtis conferta* subsp. *amblyphylla* (Cotton-wood), *Balogia inophylla* and *Lagunaria patersonia* (Norfolk Island

Hibiscus). The ground layer is sparse to absent due to the dense layer of litter and woody debris present, although the fern *Asplenium milnei* grows within exposed calcarenite.

An example of the community within the study area is shown in **Photograph 9**.

Photograph 9 Banyan-Kentia Palm Forest on Coral Sand and Calcarenite in the North Zone

4.1.5.3. 12a/Exotic: Kentia Palm Forest on Coral Sand and Calcarenite with Emergent *Araucaria heterophylla*

This community is largely the same a Variant 12a, but differs in having an emergent layer of tall, planted *Araucaria heterophylla* (Norfolk Island Pine) at around 40 m tall. It is restricted to the North Zone adjacent to Lagoon Road. The canopy is dominated by *Howea forsteriana* (Kentia Palm). Other species present in the shrub layer include *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt), *Lagunaria patersonia* (Norfolk Island Hibiscus), *Melaleuca howeana* and *Jasminum didymum* subsp. *didymium*. Within the subject land this community has a more degraded understorey with exotic grasses present such as *Cenchrus clandestinus* (Kikuyu Grass).

An example of the community within the study area is shown in **Photograph 10**.

Photograph 10 Kentia Palm Forest on Coral Sand and Calcarenite with Emergent *Araucaria heterophylla* within the North Zone

4.1.6. Greybark – Blackbutt rainforest at low to intermediate altitudes

Community #: 17a, 17b

Scientific Name: *Drypetes deplanchei – Cryptocarya triplinervis var. triplinervis – Olea paniculata – Celtis conferta subsp. amblyphylla / Myrsine platystigma – Alyxia ruscifolia / Smilax australis – Parsonsia howeana – Jasminum didymum subsp. didymum / Oplismenus imbecillis – Asplenium milnei – Carex brunnea*

Vegetation Formation: Rainforests

Vegetation Class: Oceanic Rainforests

Status: Not listed

On Lord Howe Island this community has been divided into three variants, including 17a – Greybark - Blackbutt low closed forest on exposed basalt slopes, 17b – Greybark - Blackbutt low closed forest on exposed basalt slopes, and 17c Greybark - Blackbutt low closed forest on exposed calcarenite. These variants differ structurally depending on the substrate and degree of exposure. Two of these variants have been mapped within the study area including variant 17a and 17b.

4.1.6.1. Variant 17a: Greybark – Blackbutt Rainforest

This variant is restricted to the South Zone. Of the two variants, Variant 17a is taller and more species rich, occurring on sheltered to intermediate aspects on deeper soils derived from basalt, breccia and calcarenite. Within the study area, the dominant tree species include *Celtis conferta* subsp. *amblyphylla* (Cottonwood),

Drypetes deplanchei (Greybark), *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt) and *Planchonella howeana* (Axe-handle Wood). Dominant shrub species within the community include *Alyxia ruscifolia* (Prickly Alyxia), *Myrsine platystigma* and *Ochrosia elliptica* (Red Berrywood). Other species occurring within the understorey include the vines *Howea forsteriana* (Kentia Palm), *Flagellaria indica* (Whip Vine), *Jasminum didymum* subsp. *didymum, Geitonoplesium cymosum* (Scrambling Lily), *Parsonsia howeana, Smilax australis* (Snake Vine), *Trophis scandens* subsp. *megacarpa* and the forb *Commelina cyanea* (Native Wandering Jew). The palm *Howea forsteriana* (Kentia Palm) forms only a minor component of the understorey. The native grass *Oplismenus imbecillis* was also recorded within the community.

This variant was comprised of few exotic species, with the most abundant species including *Ehrharta erecta* (Panic Veldtgrass), *Ipomoea cairica, Physalis peruviana* (Cape Gooseberry), *Solanum nigrum* (Black-berry Nightshade) and *Stenotaphrum secundatum* (Buffalo Grass).

An example of the 17a variant within the study area is shown in **Photograph 11**.

Photograph 11 Variant 17a Greybark – Blackbutt rainforest within the study area

4.1.6.2. Variant 17b: Greybark – Blackbutt low closed forest on exposed basalt slopes

This variant occupies exposed sites on ridges and areas exposed to the ocean. It is often a low, viney, near-impenetrable scrub of Greybark and Hopwood. This variant is most common in the northern hills, less common in the central lowlands and southern mountains.

Within the study area, this community occurred as a single small patch on the corner of Old Lagoon Road and Lagoon Road within the South Zone. The community consists of a low closed forest of *Dodonaea viscosa* subsp.

burmanniana (Hopwood). Other native species sparsely scattered within the community included seedlings or saplings of the trees *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt), *Lagunaria patersonia* (Norfolk Island Hibiscus) and *Drypetes deplanchei* (Greybark), the shrubs *Ochrosia elliptica* (Red Berrywood) and *Coprosma prisca* (Goatwood) and the vine *Stephania japonica* (Snake Vine). The exotic species *Ipomoea cairica* (Coastal Morning Glory) was also present within the community.

An example of the 17b variant within the study area is shown in **Photograph 12**.

Photograph 12 Variant 17b Greybark – Blackbutt low closed forest on exposed basalt slopes

4.1.7. River Mangrove tall shrubland of brackish creeks

Community #: 21

Scientific Name: *Aegiceras corniculatum*

Vegetation Formation: Saline Wetlands

Vegetation Class: Mangrove Swamps

Status: Not listed

Within the study area this community occurs along Cobby's Creek within the South Zone. The community is characterised by the presence of *Aegiceras corniculatum* (River Mangrove), with scattered occurrences of *Hibiscus tiliaceus* (Cottonwood Hibiscus). The native grass *Sporobolus virginicus* is present along the fringes of the community.

An example of the community within the study area is shown in **Photograph 13**.

Photograph 13 River Mangrove tall shrubland within the study area

4.1.8. Environmental Plantings

Environmental plantings within the study area are located along existing fences adjacent to the Lord Howe Island airport runway and along the northern side of Old Lagoon Road and eastern side of Airport Road. Environmental plantings comprise a mixture of different native species, which have been planted in rows along the fence lines to form screening/hedges/windbreaks and around existing buildings. Some of this vegetation may include remnant native vegetation that has been modified by trimming to form hedges. Species within this community include *Howea forsteriana* (Kentia Palm), *Melaleuca howeana* (Tea Tree), *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt), *Lagunaria patersonia* (Norfolk Island Hibiscus) and *Cassinia tenuifolia* (Bully Bush).

An example of environmental plantings within the study area is provided in **Photograph 14**.

Photograph 14 Environmental plantings within the subject land in the South Zone maintained through heavy trimming

4.1.9. Plantations

Plantations consist of plantations of *Howea forsteriana* (Kentia Palm) established as seed orchards for seed production in the past. They consist of even-aged and evenly spaced palms, with few other species present below. Evidence of irrigation and tree stakes are still visible within the community. Within the South Zone the canopy is comprised almost entirely of Kentia Palms that are of the same age and are relatively evenly spaced, with scattered occurrences of *Cryptocarya triplinervis* var. *triplinervis* (Blackbutt), *Hibiscus tiliaceus* (Cottonwood Hibiscus) and *Lagunaria patersonia* (Norfolk Island Hibiscus). The mid layer is largely absent, with the exception of *Howea forsteriana* (Kentia Palm) as well as scattered occurrences of *Dodonaea viscosa* subsp. *burmanniana* (Hopwood) and *Alyxia ruscifolia* (Prickly Alyxia). Other native species recorded within the community include *Jasminum didymum* subsp. *didymum*, *Parsonsia howeana* and *Stephania japonica* (Snake Vine). The exotic species *Ehrharta erecta* (Panic Veldtgrass), *Ipomoea cairica* (Coastal Morning Glory) and *Oxalis corniculata* (Creeping Oxalis) were also present.

Within the North Zone, other than *Howea forsteriana*, the few species present include *Alyxia ruscifolia* (Prickly Alyxia, *Parsonia howeana*, *Lagunaria patersonia* (Norfolk Island Hibiscus) and the introduced grass *Ehrharta erecta* (Panic Veldtgrass). In one location along Lagoon Road the ground layer is maintained as exotic grassland.

An example of plantations within the study area is provided in **Photograph 15** and **Photograph 16**.

Photograph 15 Plantation with the North Zone consisting of similarly aged and evenly spaced *Howea forsteriana*

Photograph 16 Plantation with the South Zone consisting of similarly aged and evenly spaced *Howea forsteriana*

4.1.10. Exotic Vegetation

Exotic vegetation is present within the study area in both the North and South Zone and consists predominantly of managed grasslands. These areas are dominated by exotic grasses including *Cenchrus clandestinus* (Kikuyu Grass), *Poa annua* (Winter Grass, *Stenotaphrum secundatum* (Buffalo Grass), *Sporobolus africanus* (Parramatta Grass) *Eleusine indica* (Crowsfoot Grass) and *Chloris gayana* (Rhodes Grass). Other exotic species recorded in high abundances included *Trifolium repens* (White Clover), *Hydrocotyle bonariensis*, *Hypochaeris radicata* (Catsear), *Oxalis corniculata* (Creeping Oxalis) and *Taraxacum officinale* (Dandelion).

The exotic tree, *Araucaria heterophylla* (Norfolk Island Pine) is also present as an emergent tree at various locations including along Lagoon Road and at the entrance to the airport. In such locations, these trees occur as a canopy over managed exotic grassland. There is also minor area of exotic plantings consisting of *Hibiscus rosa-sinensis*, and other ornamental plantings.

In places these grasslands are managed by mowing, but unmown areas are also present.

An example of the community within the study area is shown in **Photograph 17** and **Photograph 18**.

Photograph 17 Exotic vegetation within the North Zone comprised of managed grassland

Photograph 18 Exotic vegetation within the South Zone comprised of managed grassland beneath Norfolk Island Pines

4.2. Threatened Ecological Communities

One vegetation community identified within the study area, Sallywood Swamp Forest, occurs on poorly drained, low-lying areas and conforms to the TEC Lagunaria Swamp Forest on Lord Howe Island, which is listed as a Critically Endangered Ecological Community (CEEC) under the BC Act. This community occupies 0.03 ha within the southern portion of the study area adjacent to Cobbys Creek. The community is not present within the subject land.

The distribution of the community is restricted on Lord Howe Island to low-lying swampy areas at altitudes below 20 m. This distribution was mapped by Pickard (1983), who estimated that its original distribution may have covered as little as 6 ha distributed across five restricted locations on the island (NSW Scientific Committee 2010). None of these locations are protected within the Lord Howe Island Permanent Park Preserve, but Lagunaria Swamp Forest on Lord Howe Island falls entirely within the jurisdiction of the LHIB. Individual plants of Lagunaria patersonia may be scattered through the forests from sea level to about 600m elevation on Lord Howe Island, but such locations do not form a part of the Lagunaria Swamp Forest community (NSW Scientific Committee, 2010).

Lagunaria Swamp Forest on Lord Howe Island has been seriously depleted by land clearing at all sites of its occurrence. The remaining fragments are only a few square metres in area, are degraded by edge effects, weed invasion, alteration to water regimes and from cattle grazing. The community has been eliminated from some of its original locations, including an area behind Blinky Beach, which was cleared in 1975 during construction of the airstrip. The remnants are likely to include only a sample of the original flora and at least some appear to be transitional assemblages with other vegetation communities. However, since the initial listing of the

community as Endangered in 2003 (the highest category then available), there has been a number of restoration activities undertaken by the LHIB to begin to restore this community. Actions have involved habitat plantings and fencing of remnants, or in some cases previously occupied habitat, in order to exclude cattle (NSW Scientific Committee, 2010).

Lagunaria Swamp Forest is only listed as a TEC under the BC Act. It is not listed as a TEC under the EPBC Act. Furthermore, no other native vegetation communities within the study area or on Lord Howe Island conform to a TEC under the EPBC Act. The location of the Lagunaria Swamp Forest within the study area is shown in **Figure 9**.

4.3. Flora Species

4.3.1. General Species

A total of 80 plant species were recorded within the Study Area during surveys in 2024, of which 49 are native, and 31 are exotic species. A detailed flora species list of all the flora species recorded from the study area during field surveys is presented in **Appendix B**.

4.3.2. Threatened Species

No threatened flora species listed under the BC Act and/or EPBC Act were recorded within the subject land or wider study area during field surveys.

Eleven species listed under the BC Act and/or EPBC Act have been recorded within the locality and their locations are shown on **Figure 10**. An assessment of the likelihood of occurrence of these species within the subject land has been conducted and is presented in **Appendix A**. Most of these species are considered to have a low likelihood of occurrence as previous records on Lord Howe Island are at high altitudes on Mt Lidgbird and Mt Gower, and therefore suitable habitat for these species is not available within the subject land. However, two species are considered to have a moderate likelihood of occurrence due to the presence of suitable habitat. This includes:

- Knicker Nut (*Caesalpinia bonduc*), listed as Endangered under the BC Act; and
- Sand Spurge (*Chamaesyce psammogeton*), listed as Endangered under the BC Act.

Despite the presence of suitable habitat for the above listed species, detailed targeted threatened flora surveys conducted in the subject land and wider study area have failed to record any of the threatened flora species known to occur on Lord Howe Island. As such, this assessment concludes that no threatened flora species listed under the BC Act and/or EPBC Act are likely to occur in the subject land.

4.3.3. Exotic Species

Thirty-one (31) exotic species were recorded within the study area during surveys. On Lord Howe Island, weeds are prioritised and categorised as part of the *North Coast Local Land Services Regional Strategic Weed Management Plan 2023 – 2027 (North Coast Local Land Services, 2022)*. However management priorities to demonstrate compliance with the general biosecurity duty are identified in the Lord Howe Island Weed Management Strategy (LHIB 2016).

The Lord Howe Island Weed Management Strategy (LHIB, 2016) categorises weeds into three management categories based on their level of threat (invasiveness and impact), weed risk assessment and the feasibility of eradication. These categories are:

1. Category 1: Eradicate (immediate or suppression leading to eradication);
2. Category 2: Alert (sleeper weeds – watch and act as necessary); and
3. Category 3: Control (effectively manage).

One species, *Euphorbia paralias* (Sea Spurge), recorded within the study area is listed as a Regional Priority Weed under the North Coast Local Land Services Regional Strategic Weed Management Plan 2017 – 2020. On Lord Howe Island, the species is treated as a Category 3 control target, as it is not a declared weed and it is not considered feasible to eradicate as the species will likely continue to be dispersed to Lord Howe Island through sea-drift. The species is mostly restricted to the dune system on the lagoon foreshore and considering the ease of access, the species is considered for containment.

An additional ten weeds recorded within the study area are identified under the Lord Howe Island Weed Management Strategy (LHIB 2016). None of these are listed as priority weeds under the North Coast Local Land Services Regional Strategic Weed Management Plan. **Table 7** identifies the weed species recorded within the study area and their management category under the Lord Howe Island Weed Management Strategy (LHIB 2016). None of the weeds identified within the study area are listed as Weeds of National Significance under the NSW *Biosecurity Act 2015*.

Table 7 Category of weed species recorded within the study area in accordance with the Lord Howe Island Weed management Strategy 2016

Scientific Name	Common Name	Control Category	Current Abundance on Lord Howe Island
Araucaria heterophylla	Norfolk Island Pine	Category 3	Common - Localised
Bidens pilosa	Cobbler's Pegs	Category 3	Occasional - Widespread
Chloris gayana	Rhodes Grass	Category 3	Occasional - Localised
Ehrharta erecta	Panic Veldt Grass	Category 3	Common - Widespread
Euphorbia cyathophora	Painted Spurge	Category 3	Occasional - Localised
Euphorbia paralias	Sea Spurge	Category 3	Occasional - Localised
Ipomoea cairica	Coastal morning Glory	Category 3	Common - Widespread
Ipomoea indica	Blue Morning Glory	Category 1	Uncommon - Localised
Lilium formosanum	Formosan Lily	Category 3	Common - Widespread
Pennisetum clandestinum	Kikuyu Grass	Category 3	Common - Widespread
Sporobolus africanus	Parramatta Grass	Category 3	Common - Widespread

4.4. Fauna

4.4.1. Fauna Habitat

Fauna habitat within the study area is comprised predominantly of rainforest and shrubby vegetation with woody debris, leaf litter and rubbish providing potential shelter habitat for small threatened birds, reptiles and invertebrates. This includes commonly occurring birds such as the Lord Howe Woodhen (*Hypotaenidia sylvestris*) and Silvereye (Lord Howe Island subsp.) (*Strepera graculina crissalis*), as well as the Lord Howe Island Skink (*Oligosoma lichenigera*), the Lord Howe Island Gecko (*Christinus guentheri*) and the Lord Howe Island Placostylus (*Placostylus bivaricosus*).

Rainforest vegetation within the study area provides potential nesting and foraging habitat for a range of endemic, migratory and introduced birds. Furthermore, the western side of the study area bordering the lagoon in both the North and South Zones, comprises coastal dune habitats that are mostly grasses and sedges on sand dunes, which also provide shelter and nesting habitat for bird, reptiles and invertebrates.

4.4.2. General Species

A total of 32 fauna species have been recorded from the study area during field surveys. This included 28 birds, three reptiles, and one invertebrate. It Is noted that several other invertebrates such as commonly occurring snails and beetles were observed within the study area, however given they were not threatened species they were not identified or recorded in the species list for the study area. A detailed fauna species list of all the fauna species recorded from the study area during field surveys is presented in **Appendix C**.

4.4.3. Non-Endemic and Non-Native Species

Of the 32 species recorded within the study area, only five are classified as endemic native species under the Lord Howe Island Biodiversity Management Plan (BMP) (DECC, 2007). The remainder are classified as either non-endemic native species, non-native species or vagrants/irregular visitors (see **Appendix C**). Thirteen species are listed as non-endemic native species, being residents or regular visitors on Lord Howe Island at the time of European settlement. A further 13 species are classified in the Lord Howe Island BMP as non-native species, being residents or regular visitors on Lord Howe Island, present through either intentional/accidental introduction or by colonisation since European settlement, while one species is listed as a vagrant/irregular visitor.

4.4.4. Threatened Species

Seven threatened fauna species (all birds) listed under the BC Act were recorded within the subject land during field surveys as listed in **Table 8**. An additional six threatened species were recorded within the study area. The location of threatened fauna species recorded within the study area is shown on **Figure 11**. It is noted that records of threatened birds include the location that birds were recorded by the observers, and not necessarily the location of individual species. An additional nine threatened bird species were identified within likelihood of occurrence assessment as having the potential to occur based on previous records within the locality and the presence of suitable habitat, however as these species were not identified within the subject land or study area during targeted surveys, these species were not considered likely to rely on the habitat within the subject land and therefore have not been assessed further.

One threatened species, the Masked Booby (*Sula dactylatra*) was recorded at a survey site within the subject land, however this species was observed flying over the lagoon and not within the subject land. Given the roosting /breeding sites for the species are well known and are not located within the subject land, and suitable foraging habitat is not available within the subject land, the species has not been assessed as occurring within the subject land.

Table 8 Threatened fauna species that are known to occur within the subject land and study area

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Study Area	Subject Land
Land Birds (Resident Forest and Woodland Species)					
Hypotaenidia sylvestris	Lord Howe Woodhen	E	E	X	X
Pachycephala pectoralis contempta	Golden Whistler (Lord Howe Is. subsp.)	V	-	X	X
Strepera graculina crissalis	Pied Currawong (Lord Howe Is. subsp.)	V	V	X	X
Zosterops lateralis tephropleurus	Silvereye (Lord Howe Is. subsp.)	V	-	X	X
Seabirds (Migratory and Marine Species)					
Arenaria interpres	Ruddy Turnstone	V	V, M	X	-
Gygis alba	White Tern	V	-	X	X
Limosa lapponica baueri	Bar-tailed Godwit	E	E, M	X	-
Onychoprion fuscata	Sooty Tern	V	-	X	X
Pterodroma nigripennis	Black-winged Petrel	V	-	X	X
Sula dactylatra	Masked Booby	V	M	X	-
Invertebrates (Molluscs)					
Placostylus bivaricosus	Lord Howe Placostylus	E	E	X	-
Reptiles					
Christinus guentheri	Lord Howe Island Gecko	V	V	X	-
Oligosoma lichenigera	Lord Howe Island Skink	V	V	X	-

V = Vulnerable, E = Endangered, M=Migratory

The White Tern (*Gygis alba*) was recorded roosting and breeding within the subject land. The species typically uses the exotic Norfolk Island Pine trees for roosting and breeding, laying eggs on bare branches. The seabird may also utilise bare branches on native trees and shrubs for nesting/roosting, although all individuals identified during field surveys were recorded within the Norfolk Island Pine trees. The species was recorded in high numbers, with more than 10 individual birds recorded within each of the Norfolk Island Pine trees within the subject land. The species was also recorded flying between nest trees and foraging sites across the lagoon.

The Lord Howe Woodhen occurs within all vegetation communities within the subject land, as well as in cleared land and on beaches. The species has become highly abundant across the island following the eradication of

the Black Rat (*Rattus rattus*), with nearly 6,000 records of the species in the locality held within the NSW BioNet. While the population of the species was reduced to just nine breeding pairs in the 1970s, the latest survey undertaken in December 2024 recorded at least 1,638 woodhens, including 1,535 adults and juveniles and 26 chicks. The species was regularly observed foraging and roosting within the subject land as well as modified urban habitats around the community including sporting fields, garden beds and golf courses.

The Golden Whistler (Lord Howe Is. subsp.), Pied Currawong (Lord Howe Is. subsp.) and Silvereye (Lord Howe Is. subsp.) were all recorded within native vegetation of the subject land and wider study area. No nests were observed within the subject land, and therefore these species are likely to utilise the subject land for foraging. Given these species are all highly mobile species they would likely utilise the subject land as part of a much broader foraging range.

The Sooty Tern (*Onychoprion fuscata*) and Black-winged Petrel (*Pterodroma nigripennis*) were both recorded aerially above the subject land, in transit between foraging sites. Roosting and breeding sites for these species on Lord Howe Island are well known and not located within the subject land. As such these species are unlikely to rely on habitat within the subject land.

The NSW BioNet holds records for 44 threatened fauna species listed under the BC Act and/or EPBC Act. Furthermore, the EPBC PMST identified habitat within the locality for an additional 15 threatened fauna species. Previous records of threatened fauna within the locality are shown in **Figure 12**. An assessment of the likelihood of occurrence of potentially occurring threatened fauna species is provided in **Appendix A**. As the locality includes some ocean areas, the search yielded numerous marine species including fish, turtles and marine mammals. These are not relevant to an assessment of terrestrial ecology within the study area and are not considered further in this report.

4.4.5. Migratory Species

One migratory species, the Wedge-tailed Shearwater (*Ardenna pacifica*) was recorded within the subject land in the North Zone. Known roosting and breeding habitat is present in the subject land within the North Zone however is not present within the South Zone. This species is known to roost within the subject land and wider study area, arriving on Lord Howe Island in September and departing in May. An additional eight migratory species (three of which are also listed as threatened species) were recorded within the study area, particularly along the lagoon foreshore. The location of migratory fauna species recorded within the study area is shown on **Figure 13**. It is noted that records of migratory birds include the location that birds were recorded by the observers, and not necessarily the location of individual species.

The NSW BioNet and EPBC PMST search identified a combined 58 migratory species with potential to occur within the locality. The locations of previous records of migratory fauna within the locality are shown in **Figure 14**. An assessment of the likelihood of occurrence for these species based on habitat requirements and known records is provided in **Appendix A**. The assessment indicates that the majority these species have a low likelihood of occurrence within the subject land due to either a lack of suitable habitat resources, and/or lack of known records from the locality. However, 26 migratory fauna species are considered to have potential to occur due to the presence of suitable habitat and recent nearby records or are known to occur having been recorded during targeted fauna surveys. The majority of these potentially occurring species are considered

likely to occur aerially in transit across the subject land, rather than utilising the foraging and roosting/breeding habitat available within the subject land.

5. Impact Assessment

This chapter discusses the potential impacts of the Project on the biodiversity values of the subject land. Both direct and indirect impacts have been considered in the impact assessment, with direct impacts being primarily related to vegetation and habitat removal and indirect impacts relating to habitat fragmentation and edge effects resulting from such impacts. Prescribed impacts, although not considered separately, are mainly covered by the sections on direct impacts as detailed below.

Impacts to TECs, threatened and migratory species listed under the BC Act and/or EPBC Act are discussed within this chapter.

5.1. Direct Impacts

5.1.1. Vegetation Removal

The largest direct impact of the Project is the removal of vegetation and associated habitat within the subject land. Although there are different types of flora and fauna habitat within the subject land such as water within the lagoon, ground litter and rocks, the most extensive habitat to be impacted is represented by vegetation.

The subject land has been subject to historic disturbance and modification since human settlement, and as such the vegetation to be removed comprises small areas of remnant lowland native vegetation, environmental plantings, native plantations and exotic vegetation. Areas of vegetation communities to be removed within the subject land are provided in **Table 9**. These impacts include the removal of 0.75 ha of native vegetation, including 0.70 ha of native vegetation communities, 0.002 ha of environmental plantings, and 0.05 ha of native plantations. Larger areas of each of the native vegetation impacted within the subject land will be retained within the study area as shown in **Table 9**.

It is noted that within the South Zone, the subject land includes areas mapped as native vegetation along the existing access roads. These areas comprise overhanging canopy from trees along the existing access roads. No works are proposed to be undertaken along the existing access roads, which will only be used in their current condition if required to transport equipment.

While the Project has largely been situated within previously cleared areas, the disturbance footprint has included areas of native vegetation within the South Zone that require remediation due to contamination. These areas are only proposed to be impacted because of the remediation and not required for the construction and operation of the WMF.

Furthermore, the Project includes revegetation within the subject land to re-establish vegetation consistent with the vegetation communities to be cleared, resulting in an no net loss of native vegetation and associated habitat within the subject land. The location of areas subject to revegetation are detailed within the Projects Landscape and Urban Design Plan (Spackman Mossop Michaels and Lahznimmo Architects, 2025).

The native vegetation communities to be removed for the Project are well represented on Lord Howe Island, and minor impacts associated with Project are not considered to significantly alter the composition and distribution of these communities on Lord Howe Island. Furthermore, none of the native vegetation to be removed within the subject land conforms to a threatened ecological community under the BC Act or EPBC Act.

Mitigation measures to address the loss of vegetation and associated habitat are addressed in **Chapter 6**.

Table 9 Vegetation communities removed within the subject land and retained within the study area

Community #	Vegetation Community	BC Act Status	EPBC Act Status	Removed within the Subject Land (ha)			Retained within the Study Area		
				North Zone	South Zone[2]	Sub Total	North Zone	South Zone	Sub Total
Native Vegetation									
1	Coastal Spinifex - Dune Bean - Club Rush - Melanthera biflora - Saltwater Couch beach strandline grassland	-	-	0.00	0.26	0.26	0.00	1.06	1.06
2	Melanthera biflora – Saltwater Couch herbland/grassland on coral boulder beaches and rocky headlands	-	-	0.01	0.00	0.01	0.23	0.00	0.23
6	Sallywood swamp forest of poorly drained, low-lying areas	CEEC	CEEC	0.00	0.00	0.00	0.00	0.03	0.03
8	Bully Bush - Hopwood shrubland on shallow rocky soils	-	-	0.04	0.06	0.10	0.14	0.58	0.72
12a	Kentia Palm Forest on coral sand and calcarenite	-	-	0.01	0.17	0.18	0.05	0.97	1.02
12b	Banyan - Kentia Palm forest on coral sand and calcarenite	-	-	0.00	0.00	0.00	0.14	0.00	0.14
12a/Ex	Kentia Palm Forest on coral sand and calcarenite with emergent *Araucaria heterophylla*	-	-	0.02	0.00	0.02	0.23	0.00	0.23
17a	Greybark - Blackbutt rainforest	-	-	0.00	0.13	0.13	0.00	1.67	1.67
17b	Greybark - Blackbutt low closed forest on exposed basalt slopes	-	-	0.00	0.00	0.00	0.00	0.01	0.01
21	River Mangrove tall shrubland of brackish creeks	-	-	0.00	0.00	0.00	0.00	0.06	0.06
Ep	Environmental plantings	-	-	0.00	0.002	0.00	0.00	0.43	0.43
Np	Plantation	-	-	0.05	0.00	0.05	0.20	0.13	0.34
Subtotal[1]				**0.14**	**0.61**	**0.75**	**0.99**	**4.94**	**5.93**
Other Vegetation									

Community #	Vegetation Community	BC Act Status	EPBC Act Status	Removed within the Subject Land (ha)			Retained within the Study Area		
				North Zone	South Zone[2]	Sub Total	North Zone	South Zone	Sub Total
Ex	Exotic Vegetation	-	-	0.33	1.48	1.81	0.16	5.62	5.79
Beach	Sand/Boulder Beach	-	-	0.34	0.01	0.34	0.79	1.06	1.85
Cl	Cleared land	-	-	0.38	1.08	1.46	0.10	0.66	0.76
Water	Water	-	-	0.89	0.00	0.89	0.11	0.00	0.11
Subtotal[1]				**1.94**	**2.57**	**4.51**	**1.17**	**7.34**	**8.51**
Total[1]				**2.08**	**3.18**	**5.26**	**2.16**	**12.28**	**14.44**

1. In some cases totals may not add up due to rounding

The vegetation within the North Zone has been subject to historical disturbance. Aerial imagery from 2006 shows that there was minimal vegetation along the seawall and banks of the lagoon both to the north and south of the existing jetty, which is expected given these areas would have been completely cleared to construct the sea wall (see **Figure 15**). The vegetation along the banks appears to be limited to shrubs planted in a defined row along the top of the bank as well as plantings of Kentia Palms in rows within grassland areas adjacent to Lagoon Road, south of the existing jetty. Today, the banks consist of dense shrubs that conform to Bully Bush – Hopwood shrubland (Community 8), with a narrow strip of Melanthera biflora – Saltwater Couch herbland/grassland on coral boulder beaches and rocky headlands (Community 2) along the western edge. Furthermore, planted Kentia Palms are now established within mown areas of exotic grassland.

The South Zone has also been subject to historical disturbance. Access roads including Old Lagoon Road have been maintained within the subject land as well as access into the WMF and several tracks down onto Lagoon Beach. Aerial imagery from 2006 shows the extent of previous disturbance within and around the WMF, particularly along the coast between Cobbys Creek to the south and the boundary of the airport in the north (see **Figure 16**). It is expected that native grasslands (Community 1) along the beach strandline have persisted despite historical disturbance, although the invasion of exotic grasses as a result of disturbance is evident today. The large patches of rainforest vegetation within the South Zone have remained relatively consistent in distribution. Smaller patches of rainforest vegetation on the southern side of the WMF and in the south near Lagoon Road, which appear to have existed as predominantly shrubby vegetation since 2006, have regenerated into intact rainforest vegetation today, although these patches are small and linear, and are degraded as a result of edge effects and continued disturbance from the operation of the WMF. In the 2006 aerial imagery, previously disturbed areas along the lagoon appear to be comprised predominantly of grassland vegetation with scattered shrubs. Today, these areas have naturally regenerated into dense shrubland vegetation that conforms to Bully Bush – Hopwood shrubland (Community 8).

While aerial imagery from 2006 and earlier can be hard to determine exactly how much vegetation within the study area comprises remnant native vegetation, evidence suggests that almost all of the vegetation within the subject land has been subject to historic disturbance and is largely comprised of planted and regrowth vegetation that has matured and is now consistent with the occurrence of native vegetation communities on Lord Howe Island as described in Sheringham et al. (2016a).

5.1.2. Loss of Specific Habitat Features

In addition to the clearance of broad habitats, the Project will include the removal of specific habitat features within the subject land. Specific fauna habitat features that will be removed by the Project include:

- Blossom-producing trees and shrubs suitable as foraging for a range of frugivores, nectarivores and insectivores;
- Shrubby understorey vegetation that offers shelter and foraging habitat for small birds; and
- Ground covers including dense leaf litter and rocks that provide shelter and foraging resources for reptiles and invertebrates.

The loss of these habitat features within the development footprint is discussed further below.

The removal of these habitat features also has the potential to directly impact the fauna species utilising the habitats during the clearing process. Although birds are highly mobile species and likely to self-relocate during this period, there is potential for fauna to remain within the habitat features, such as under rocks and within dense leaf litter. As such, species with a higher potential to be impacted during the clearing process include the less mobile species such as the Lord Howe Island Skink, Lord Howe Island Gecko and the Lord Howe Placostylus that have the potential to occur. There is potential for injury and mortality during the clearing process to these individuals (if present within the clearing areas) if appropriate mitigation measures aren't implemented. If the mitigation measures outlined in **Chapter 6** are implemented, these impacts can be avoided or minimised.

Despite the Project resulting in the removal of habitat and specific habitat features, extensive areas of land containing similar habitat occurs within the study area and surrounds. It is anticipated that the types of flora and fauna species utilising the habitat within the subject land will continue to persist within other areas of the study area where suitable habitat is present.

5.2. Indirect Impacts

The Project may result in some indirect impacts on the ecological values of remaining vegetation and habitat within the study area, including edge effects, habitat fragmentation and introduction of exotic species and diseases.

Additionally, several construction and operational impacts, such as those relating to dust, noise, light and erosion, will also impact the remaining vegetation and habitat. Indirect impacts relevant to the Project are considered in more detail below. Whilst it is acknowledged that indirect impacts can potentially be significant for a variety of threatened species, such impacts cannot be mapped or accurately calculated in advance.

Measures to mitigate against indirect impacts are addressed in **Chapter 6**.

5.2.1. Edge Effects

Edge effects are impacts that occur at the interface between natural habitats, especially forests and disturbed or developed land (Yahner, 1988). When an edge is created between woodland and a cleared area, changes to ecological processes within the vegetation can extend between 10 m and 100 m from the edge (Yahner, 1988). These include microclimatic changes in light, temperature, humidity and wind, which can favour a suite of different species and therefore cause significant changes to the ecology of the patch (Lindenmayer and Fischer, 2007). These changes include; invasion by weeds, increase in feral animals, reduction in tree health, and barriers to dispersal or distribution (Yahner, 1988). Edge effects are typically more pronounced in small habitat fragments and they may extend throughout small patches, rendering them unsuitable for some species. In particular, small patches of woodland habitat may be unfavourable for species which require interior habitat. As habitat loss progresses, the understanding of edge effects on ecological processes becomes increasingly important (Rand, Tylianakis and Tscharntke, 2006).

The Project will result in edge effects where woody vegetation is cleared within the subject land. Due to edge effects, the impacts of the Project could potentially extend beyond the clearing limits into areas of retained vegetation in the study area. However, vegetation removal is predominantly proposed to be undertaken along

the edges of previously fragmented patches of vegetation and therefore the vegetation to be retained within the study area will be exposed to similar edge effects to current conditions rather than an increase in the area impacted by edge effects. Nevertheless, small areas of vegetation woody vegetation will be impacted by edge effects.

If the mitigation measures outlined in **Chapter 6** are undertaken, which includes the implementation of specific management plans relevant to the retained vegetation, then this impact can be minimised.

5.2.2. Habitat Fragmentation

Fragmentation is the process where habitats that were once continuous become divided into separate fragments isolated from each other by non-forest land (Primack, 1993; Fahrig, 2003; Lindenmayer and Fischer, 2007). This process, together with habitat loss, is a major cause of biodiversity loss and a threat to native species (Rand, Tylianakis and Tscharntke, 2006). Habitat fragmentation affects biodiversity by reducing the amount of available habitat for some species to occupy due to increased distances between habitat patches. Plants and other sessile organisms are usually directly removed, while mobile animals (especially birds and mammals) retreat into other remnant patches of habitat (Lindenmayer and Fischer, 2007). The displacement of mobile fauna can reduce the survivorship of species in the case where there are limited areas of sufficiently large habitat within dispersal distance to retreat to.

The Project is unlikely to increase fragmentation within the study area. The vegetation to be removed within the subject land is located along the edges of previously fragmented patches. As such, there will be a reduction in the extent of each patch of vegetation within the study area, however the Project is unlikely to result in fragmentation of retained vegetation into further patches.

5.2.3. Introduction of Exotic Species and Disease

As the Project involves ongoing ingress of shipping freight, biosecurity risks are paramount on the island. After land clearing, the biggest post-settlement impact to the island biota has come from introductions of exotic flora and fauna as well as plant diseases. While there is a risk of introduction of exotic species and diseases from tourists and other sources, this remains the biggest threat to island biota.

Alterations to habitat conditions often favour introduced and/or hardy native plant species that can proliferate in disturbed conditions. Such species have potential to impact upon the original local native plant species. Weeds such as exotic grasses and other introduced plants have potential to outcompete regenerating native plant species.

Exotic fauna species also pose a significant threat to native biota, with recent evidence of endemic species recovering from close to extinction following the eradication of rats and mice.

The Lord Howe Island Biosecurity Strategy 2022-2024 aims to reduce the likelihood of invasive species introduction to Lord Howe Island and includes the following objectives:

- Reduced risk of non-native species being introduced to Lord Howe Island;
- Early detection of any new introductions that do occur;

- Reduced impact of established non-native species on biodiversity, community, economic and island values; and
- Increased level of knowledge about the risks posed by non-native species and understanding of measures required to minimise these risks amongst the LHI community, visitors and other stakeholders.

The continued implementation of biosecurity measures including quarantine protocols and surveillance including the use of detection dogs is vital to prevent the introduction of exotic pests and diseases. While the existing freight services are subject to these biosecurity measures, continued implementation of biosecurity measures is paramount to preventing the introduction of exotic species and diseases.

5.2.4. Construction and Operation Impacts

A number of indirect impacts relevant to the construction and operation phases of the Project have the potential to impact the ecological values of the study area, such as those relating to dust, noise, light and introduction of exotic species and disease.

A suite of mitigation measures are proposed to minimise the indirect impacts described below. These measures are discussed in **Chapter 6**.

5.2.4.1. Dust

Construction activities can generate dust, which may impact on the ecology within the study area in a number of ways. Dust that settles can accumulate on leaf surfaces and reduce essential physiological processes including photosynthesis, respiration, and transpiration. It can also permit the penetration of phytotoxic gaseous pollutants into plants (Farmer, 1993).

Dust can also produce physical effects on plants such as blockage and damage to stomata, shading, and abrasion of leaf surface or cuticle. This can result in cumulative effects such as drought stress on already stressed species. This can result in decreased plant health, and even death in extreme circumstances. Decreased growth and vigour of plants may mean that they are more susceptible to pathogens and other disturbance, and these plants are more likely to be subject to increased mortality. Such impacts to individual plants generally result in decreased productivity and can result in changes in vegetation and community structure (Farmer, 1993).

The effect of dust deposition also affects animals that use plants, either as a source of food or habitat. Dust on the foliage and fruit may reduce palatability to animals and decreased health of trees and changed community structure results in a reduction in the amount of available habitat.

Dust pollution can lead to a decrease in habitat quality which has the potential to extend the area of impact beyond the area directly disturbed by the Project. Given the World Heritage status of the island and its popularity for tourism, dust can also affect the aesthetics of the study area and surrounding areas.

It is likely that dust would only be generated during the construction phase of the Project and dust is unlikely to have a significant long-term impact on any flora or fauna species. Dust should be monitored during construction and if required dust suppression should be implemented.

5.2.4.2. Noise

Noise can affect animal physiology and behaviour, and if it becomes an ongoing stress, it can be injurious to an animal's energy budget, reproductive success and long-term survival. There are other potential impacts that include habitat loss through avoidance, reduced reproductive success and a retreat away from favourable habitats (AMEC, 2005).

Noise also affects the way that animal-created sounds are heard and interpreted by other animals. This can include mating calls, territorial calls and alarm calls. Interference with these calls by noise generated by the Project has the potential to disrupt the species relying on these calls with deleterious results including reduced reproductive success and mortality (AMEC, 2005).

The Project can generate significant noise during construction of infrastructure and associated buildings. Noise can be generated by increased volumes of traffic, particularly trucks and machinery. Some fauna species are sensitive to elevated levels of noise in their environment, and this has the potential to impact negatively on these species (AMEC, 2005).

The noise created by the construction of the Project may affect native fauna species as well as the value of habitats that remain. Given the subject land is currently used for similar operations as those proposed as part of the Project, it is unlikely that noise levels would be significantly higher during the operation phase of the Project compared to current conditions. Furthermore, it is likely that most animal species will habituate to the periodic noise disturbance (AMEC, 2005), and the construction and operational phases of the Project are likely to cause temporary disturbance only to fauna. While some species are likely to move in response to noise, impacts from noise are likely to be localised and are not likely to have a significant, long-term, impact on wildlife populations.

5.2.4.3. Artificial Light

The Project has the potential to increase the level of artificial light in the natural environment during the construction and operational phases. Increased light levels may adversely impact wildlife by direct glare, chronic or periodic increased illumination and temporary unexpected fluctuations in light levels (Saleh, 2007; Longcore and Rich, 2010).

Research into impacts from altered lighting indicates that it can trigger behavioural and physiological responses that include but are not limited to:

- Changes in foraging behaviour;
- A disruption of seasonal day length cues which trigger critical behaviours (Longcore and Rich, 2004, 2010; Saleh, 2007);
- Disorientation and/or temporary blindness; and
- Interference with predator-prey relationships.

While the construction and operational phases of the Project will have some effect on the surrounding environment, the impacts from light pollution are likely to remain close to the disturbance, with only limited

glare into the surrounding vegetation. The following simple management principals of best practice lighting design should be implemented to reduce light pollution and minimise the effects of artificial light on wildlife (Commonwealth DCCEEW, 2023). This includes:

1. Start with natural darkness and only add light for specific purposes;
2. Use adaptive light controls to manage light timing, intensity and colour;
3. Light only the object or area intended – keep lights close to the ground, directed, and shielded to avoid light spill;,
4. Use the lowest intensity lighting appropriate for the task;
5. Use non-reflective, dark coloured surfaces; and
6. Use lights with reduced or filtered blue, violet and ultraviolet wavelengths.

With the implementation of the above best practice management principals, it is unlikely that artificial light would have a significant impact on native fauna species. It is likely that most fauna species would habituate to the periodic disturbance from light pollution given the local setting of the Project and current uses of the subject land. As such the Project is unlikely to have a significant or long-term impact on any fauna species.

5.2.4.4. Introduction of Exotic Species and Diseases

The Project has the potential to increase risk from exotic species and disease during the construction phase of the Project due to the increase in machinery and other construction equipment/materials that are brought to the island. All machinery and equipment/materials that are brought to the island are subject to strict quarantine protocols to prevent the introduction of exotic species. Furthermore, it is recommended that biosecurity protocols are implemented for workers entering and leaving the construction site, to ensure that exotic plant material or diseases are not transported between the construction site and other areas of the community. While risks from introduced species and disease will continue to pose a significant threat to the biodiversity on Lord Howe Island, the continued implementation of existing biosecurity measures is considered to minimise the risks of these threats.

5.3. Impacts on Threatened Ecological Communities

One TEC has been identified within the study area however it is not located within the subject land. The TEC is located in the southern portion of the South Zone along Cobbys Creek. No works are proposed to be undertaken in the vicinity of the TEC and therefore the Project is unlikely to impact upon the TEC.

5.4. Impacts on Threatened Flora Species

Two threatened flora species, Knicker Nut (*Caesalpinia bonduc*) and Sand Spurge (*Chamaesyce psammogeton*) were considered to have a moderate potential to occur within the subject land (see **Appendix A**), however neither species was recorded during targeted surveys. Furthermore, no other threatened flora species listed under the BC Act were recorded within the subject land or wider study area. As such, no significant impacts are predicted to occur to threatened flora species as a result of the Project.

5.5. Impacts on Threatened Fauna Species

The Project will result in the removal of suitable foraging and/or breeding habitat for threatened fauna species known to occur within the subject land. Seven threatened fauna species have been recorded within the subject land during field surveys, all being birds of which are highly mobile species capable of accessing habitat throughout the study area and wider locality.

A further six threatened species listed under the BC Act and/or EPBC Act have been recorded within the study area, and despite not being recorded within the subject land, are considered to have the potential to occur. This includes three birds, the Ruddy Turnstone (*Arenaria interpres*), Bar-tailed Godwit (*Limosa lapponica baueri*) and Masked Booby (*Sula dactylatra*), two reptiles, the Lord Howe Island Skink (*Oligosoma lichenigera*) and Lord Howe Island Gecko (*Christinus guentheri*) and one invertebrate, the Lord Howe Placostylus (*Placostylus bivaricosus*). Although these species were not recorded within the subject land, suitable habitat is considered to occur.

Further details on the impacts to habitat for the threatened species recorded within the subject land are provided below, whilst a table summarising the total area of habitat to be removed within the subject land is provided in **Table 10**.

5.5.1. Known Threatened Species

Of the threatened birds recorded within the subject land, the Sooty Tern (*Onychoprion fuscata*) and Black-winged Petrel (*Pterodroma nigripennis*) were both recorded aerially above the subject land, in transit between foraging sites. Habitat for these two species is limited to a very small area of foraging habitat (approximately 0.89 ha) within the lagoon adjacent to the existing jetty. The Sooty Tern is also known to roost on beaches, however the species was not recorded roosting within the subject land and given the species have known roosting/breeding sites at Ned's Beach and Blinky Beach on the eastern side of the island, the small area of beach within the subject land is not considered to be used as roosting habitat. Potential habitat for these species may be reduced marginally, however these impacts are largely restricted to short-term impacts during construction of the marine infrastructure and foraging habitat within the lagoon will be available in the long term. The location of suitable habitat for the Sooty Tern and Black-winged Petrel within the study area is provided in **Figure 17** and **Figure 18**, respectively.

The remaining threatened birds known to occur include the White Tern (*Gygis alba*), Lord Howe Woodhen (*Hypotaenidia sylvestris*), Golden Whistler (Lord Howe Is. subsp.) (*Pachycephala pectoralis contempta*), Pied Currawong (Lord Howe Is. subsp.) (*Strepera graculina crissalis*) and Silvereye (Lord Howe Is. subsp.) (*Zosterops lateralis tephropleurus*).

Approximately 0.21 ha of suitable roosting and breeding habitat (comprising five Norfolk Island Pine trees) and 0.89 ha of suitable foraging habitat is available within the subject land, all of which is located within the North Zone. The location of suitable habitat for the White Tern within the subject land and wider study area is provided in **Figure 19**. While the Norfolk Island Pine trees are an introduced tree species on the island, White Terns predominantly use the Norfolk Island Pines for roosting and breeding. While one Norfolk Island Pine tree will be removed within the subject land comprising approximately 0.01 ha, a further four Norfolk Island Pine Trees covering 0.20 ha will be retained within the subject land which will continue to provide suitable roosting

and breeding habitat for the White Tern. Within the North Zone, the White Tern was only recorded within the Norfolk Island Pine trees, however, the species also utilises bare branches on other trees and shrubs for breeding. The Project has been designed to avoid native vegetation to the largest extent possible and therefore large areas of suitable roosting and breeding habitat have been retained within the study area. Furthermore, large areas of suitable habitat including a significant number of Norfolk Island Pine trees are available beyond the study area in close proximity to the lagoon which are also known to be used by the White Tern for roosting and breeding. Given the large areas of available habitat retained within the subject land, study area and wider locality, the removal of one Norfolk Island Pine tree is not considered to have a significant impact on the White Tern. The White Tern has not been observed foraging within the subject land, however approximately 0.89 ha of water in the North Zone within the lagoon provide potential foraging habitat. Impacts to foraging habitat will be predominantly short term, limited to the construction phase of the Project and given the large areas of suitable foraging habitat within the locality, the Project is not considered to have a significant impact on foraging habitat for the White Tern.

Approximately 2.57 ha of known foraging and breeding habitat will be removed within the subject land for the Lord Howe Island Woodhen as shown in **Figure 20**. 0.75 ha of native vegetation and 1.81 ha of exotic vegetation. While 2.57 ha of suitable habitat will be removed within the subject land, 11.72 ha will remain within the study area. Furthermore, landscaping is proposed to be undertaken within the subject land to ensure there is no net loss of native vegetation that provides suitable habitat for the species. The Lord Howe Woodhen has also been recorded using cleared areas such as roads and laydown areas which have not been considered within this assessment. The Lord Howe Island Woodhen has become highly abundant across the island due to the successful captive breeding program as well as the eradication of the Black Rat (*Rattus rattus*) with nearly 6,000 records of the species in the locality held within the NSW BioNet. The species was regularly observed foraging and roosting within the subject land as well as modified urban habitats around the community including sporting fields, garden beds and the golf course. Records of the species occurring across most vegetation communities across the island and therefore the small area of habitat to be removed within the subject land is unlikely to have a significant impact on the species given the large areas of suitable habitat available in the study area and wider assessment area.

The Golden Whistler (Lord Howe Is. subsp.), Pied Currawong (Lord Howe Is. subsp.) and Silvereye (Lord Howe Is. subsp.) are all woodland birds that are known to occur within the subject land. Approximately 0.65 ha of native vegetation that provides suitable habitat for these species will be removed from the subject land. The location of suitable habitat for the Golden Whistler (Lord Howe Is. subsp.), Pied Currawong (Lord Howe Is. subsp.) and Silvereye (Lord Howe Is. subsp.) is shown in **Figures 21**, **Figure 22** and **Figure 23,** respectively. These species are all highly mobile and are unlikely to rely solely on the habitat within the subject land. While there will be a small area (0.65 ha) of suitable habitat removed within the subject land, larger areas are available within the study area (0.65 ha) and wider locality which will be managed and protected in the long term.

Formal Tests of Significance under Section 7.3 of the BC Act have been prepared for the seven threatened fauna species known to occur based on the presence of suitable habitat and are included within the FFA in **Appendix D**. The Tests of Significance indicate that the Project is unlikely to result in a significant impact on any of the known threatened fauna species.

5.5.2. Potentially Occurring Threatened Species

Ruddy Turnstone (*Arenaria interpres*) and Bar-tailed Godwit (*Limosa lapponica baueri*) were both recorded within the study area. Both species were only recorded within the South Zone, foraging within tidal areas of the beach. While the Ruddy Turnstone was recorded along the beach in both the northern and southern portions of the South Zone, the Bar-tailed Godwit was only recorded in the southern portion around Cobbys Creek. Both species were recorded on multiple occasions, however the species was only recorded within the tidal areas of the beach. Within the South Zone, the subject land does not include any section of beach and therefore no suitable habitat is available for the species within the subject land in the South Zone. While these two species were not observed within the North Zone, the subject land does include a small section of beach habitat within the tidal zone that offers potential foraging habitat (approximately 0.34 ha) for these two species. Despite the potential habitat available, the NSW BioNet Atlas only holds records of the Ruddy Turnstone within the subject land and wider North Zone study area.

Potential habitat for these species may be reduced marginally, however these impacts are largely restricted to short-term impacts during construction of the marine infrastructure and foraging habitat along the beach will be available in the long term. The location of suitable habitat for the Ruddy Turnstone and Bar-tailed Godwit within the subject land and study is shown in **Figure 24** and **Figure 25**, respectively.

The Masked Booby (*Sula dactylatra*) was recorded flying aerially across the study area within the South Zone. One individual bird was observed flying predominantly along the edge of the lagoon and over the beach, repeatedly flying back and forth appearing to be foraging over the shallow waters of the lagoon. However, no suitable foraging habitat is available within the South Zone. A small area (0.89 ha) of foraging habitat is available within the North Zone. This is limited to the areas of the lagoon that are within the subject land around the existing jetty. While these areas offer habitat for suitable prey species, they are located in close proximity to the jetty which is a highly disturbed area and is unlikely to be used by the species for foraging. Nevertheless, on a precautionary approach, the small area of the lagoon within the North Zone has been identified as suitable habitat for the species. The removal of a 0.89 ha of potential, albeit marginal foraging habitat is unlikely to have a significant impact on the species in the short or long term, especially given the species is a marine pelagic species that typically feeds at sea. Roosting and breeding sites for the Masked Booby are well studied on Lord Howe Island, and are not located within the subject land or wider study area. Despite the small area of potential foraging habitat, the occurrence of the species within the subject land and wider study area is likely limited to aerial records when the species is in transit between roosting/breeding sites and foraging sites. As such, the Project is not considered to have a significant impact on the Masked Booby. The location of suitable habitat for the Masked Booby within the subject land and study area is shown in **Figure 26**.

The Lord Howe Island Skink and Lord Howe Island Gecko were not recorded within the subject land, however, were recorded in areas immediately adjacent to the subject land and are considered to have the potential to occur. Despite not being present within the subject land or study area, potential habitat is available and has been mapped in **Figures 27** and **28**, respectively. Approximately 6.73 ha of suitable habitat is available within the study area, with approximately 0.80 ha proposed to be removed within the subject land. Habitat mapped for these species has included grassy and shrubby communities on the beach margin which is described as potential habitat for both species in the Lord Howe Island BMP. However, records of the species during field

surveys suggest that they favour closed forests with higher levels of litter, calcarenite outcropping and an abundance of trees/palms which have largely been avoided through the design of the Project. The habitat to be removed within the subject land is located on predominantly coral sandy soils and calcarenite rock is absent, with the exception of areas along the beach which are tidal. Furthermore, these areas have generally low litter cover and therefore are not considered to provide optimal shelter habitat for these two reptile species. Nevertheless, a precautionary approach has been taken to identify potential habitat for these species and therefore all areas of native vegetation within the subject land have been considered as potential habitat.

Approximately 0.42 ha of potential habitat for the Lord Howe Placostylus will be removed within the subject land as shown in **Figure 29**. This includes all areas of native vegetation that comprises dense litter cover. As well as a high numbers of empty shells. However, no live snails were recorded within the subject land. Furthermore, the subject land is not located within the species known area of occupancy. The Lord Howe Placostylus is not highly mobile however known populations occur within the study area in both the North and South Zones. Within the North Zone, the Project may potentially reduce the extent of habitat available for the species, however it is not likely to fragment the existing population into two or more populations as the disturbance occurs beyond the known area of occupancy. Within the South Zone, the species has been recorded in two general locations. One along the existing access road to the north, and one in the central portion of the study area slightly east of the existing waste facility access gate. Given the species is not highly mobile, and the occurrences of the species within the South Zone are approximately 220 m apart, they have been considered as separate populations. The subject land is located outside of the known area of occupancy for the two populations within the South Zone and therefore the Project is not considered to remove known habitat for the species within the South Zone. Furthermore, the Project is unlikely to fragment the population in the central portion of the South Zone as impacts are located outside of the known area of occupancy. Overall, the extent of suitable habitat available to the population may be reduced, however the known area of occupancy will not be reduced.

Large areas of suitable habitat (approximately 3.91 ha) to remain undisturbed within the study area, both within the North Zone and South Zone, have large quantities of old, empty Lord Howe Placostylus shells, suggesting these areas comprise suitable habitat and would have been occupied by the species prior to the invasion of the Black Rat. Therefore, large areas of suitable habitat will be retained within the study area.

Formal Tests of Significance have been prepared for the six threatened fauna species considered to have the potential to occur, based on the presence of suitable habitat, and are presented in **Appendix D**. The Tests of Significance indicate that the Project is unlikely to result in a significant impact on any of the potentially occurring threatened fauna species.

Table 10 Summary of habitat for known and potentially occurring threatened species within the study area and subject land

Common Name	Scientific Name	Occurrence Summary	Habitat Type	Study Area			Subject Land		
				North Zone	South Zone	Total	North Zone	South Zone	Total
Birds									
White Tern	*Gygis alba*	Known	Foraging Habitat	1.02	0.00	1.02	0.89	0.00	0.89
			Roosting/Breeding Habitat	0.52	0.00	0.52	0.21	0.00	0.24
Lord Howe Woodhen	*Hypotaenidia sylvestris*	Known	Foraging/Roosting/Breeding Habitat	1.63	12.65	14.29	0.47	2.09	3.27
Sooty Tern	*Onychoprion fuscata*	Known	Foraging/Roosting/Breeding Habitat	1.00	0.00	1.00	0.89	0.00	0.89
Black-winged Petrel	*Pterodroma nigripennis*	Known	Foraging/Roosting/Breeding Habitat	1.00	0.00	1.00	0.89	0.00	0.89
Golden Whistler (Lord Howe Is. subsp.)	*Pachycephala pectoralis contempta*	Known	Foraging/Roosting/Breeding Habitat	1.06	4.31	5.36	0.26	0.39	1.21
Pied Currawong (Lord Howe Is. subsp.)	*Strepera graculina crissalis*	Known	Foraging/Roosting/Breeding Habitat	1.06	4.31	5.36	0.26	0.39	1.21
Silvereye (Lord Howe Is. subsp.)	*Zosterops lateralis tephropleurus*	Known	Foraging/Roosting/Breeding Habitat	1.06	4.31	5.36	0.26	0.39	1.21
Ruddy Turnstone	*Arenaria interpres*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.01	0.34
Bar-tailed Godwit	*Limosa lapponica baueri*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.01	0.34
Masked Booby	*Sula dactylatra*	Potential	Foraging Habitat	1.02	0.00	1.02	0.89	0.00	0.89
Reptiles									
Lord Howe Island Skink	*Oligosoma lichenigera*	Potential	Foraging/Roosting/Breeding Habitat	1.18	5.55	6.73	0.18	0.61	0.80
Lord Howe Island Gecko	*Christinus guentheri*	Potential	Foraging/Roosting/Breeding Habitat	1.18	5.55	6.73	0.18	0.61	0.80

Common Name	Scientific Name	Occurrence Summary	Habitat Type	Study Area			Subject Land		
				North Zone	South Zone	Total	North Zone	South Zone	Total
Invertebrates (Molluscs)									
Lord Howe Placostylus	*Placostylus bivaricosus*	Potential	Foraging/Roosting/Breeding Habitat	0.88	3.03	3.91	0.12	0.30	0.42

5.6. Impact on Migratory Fauna Species

The Project will result in the removal of known roosting and breeding habitat for one migratory species, the Wedge-tailed Shearwater (*Ardenna pacifica*). The Wedge-tailed Shearwater was the only migratory species recorded within the subject land, however a further 26 migratory species are considered to have the potential to occur as identified in the likelihood of occurrence table in **Appendix A**. Of the, potentially occurring migratory species, only eight species were recorded within the study area during targeted surveys. These species are considered to be the most likely to occur and have been discussed as potentially occurring migratory species in ***Section 6.5.2***. These are all highly mobile species capable of accessing habitat throughout the study area and wider locality. Further details on the impacts to habitat for the migratory species recorded within the subject land are provided below, whilst a table summarising the total area of habitat to be removed within the subject land is provided in **Table 11**.

5.6.1. Known Migratory Species

Approximately 0.06 ha of known roosting and breeding habitat will be removed within the subject land for the Wedge-tailed Shearwater. This includes approximately 0.04 ha of native vegetation and 0.02 ha of exotic vegetation all within the North Zone along the banks of the lagoon on either side of the existing wharf. While the species was also recorded within the South Zone, this was a flyover record and the species is not known to utilise potential habitat available within the South Zone. The location of suitable habitat for the Wedge-tailed Shearwater within the subject land and wider study area is shown in **Figure 30**.

Within the North Zone the species was observed during surveys roosting in areas of exotic grassland, including mown lawns, as well as within cleared areas and on the road. While cleared areas which include roads are used by the species for roosting, these areas are not considered as suitable habitat for the species within this assessment. Given the species uses a variety of habitats for roosting (i.e. cleared land, exotic grassland, native vegetation), the small area of habitat to be removed is unlikely to significantly impact the roosting habits of the species. Furthermore, as identified in the Projects Landscape and Urban Design Plans, areas of exotic grassland will be re-established adjacent to the jetty following construction of the Project which will continue to provide roosting habitat for the species in the long-term.

The North Zone also provides known breeding habitat for the species with burrows excavated within unmanaged exotic grassland and native vegetation along the banks of the lagoon. The Wedge-tailed Shearwater is a migratory marine species that arrives on Lord Howe Island from early August to early September. They will generally lay eggs from late November to early December, with birds fledging by late April to early May. A stretch of approximately 260 m along the banks of the North Zone is used by the species for breeding, of which up to approximately 60 m may be removed within the subject land immediately adjacent to the existing wharf. This, however, includes all areas subject to disturbance for construction of the Project, with the majority of exotic grassland within the subject land proposed to be re-established which will continue to provide breeding habitat for the species in the long term. Provided works are undertaken outside of the key breeding periods when the species is not present (or in very low numbers) on the island, then impacts to the species will be limited to the reduction of a small area of breeding habitat. Overall, breeding habitat for the species will be slightly reduced, however large areas of suitable breeding habitat will be retained within the study area.

5.6.2. Potentially Occurring Migratory Species

Three of the migratory species recorded within the study area and are considered to have potential to occur within the subject land are also listed as threatened species and have been assessed in ***Section 5.5***. This includes the Bar-tailed Godwit, Ruddy Turnstone and Masked Booby. The Project is not considered to have a significant impact on these three potentially occurring migratory species.

The Common Noddy was only recorded within the study area in the South Zone. The species was recorded flying along the edge of the beach and over the lagoon. The subject land does not provide suitable roosting/breeding habitat in the form of rocky islets and stacks with precipitous cliffs. While the species may roost on beaches, the subject land comprises a very small area of beach habitat that is tidal and not considered to be preferred roosting habitat. As such, suitable habitat for the species is limited to a very small area of foraging habitat (approximately 0.89 ha) within the lagoon adjacent to the existing jetty. The location of suitable habitat within the subject land and wider study area for the Common Noddy is shown in **Figure 31**. Potential habitat for the species may be reduced marginally, however these impacts are largely restricted to short-term impacts during construction of the marine infrastructure and foraging habitat within the lagoon will be available in the long-term with only a reduction of approximately 0.02 ha of habitat which will form part of the piled vessel ramp. Furthermore, significantly larger areas of more suitable habitat are available within the study area and wider locality.

The Wandering Tattler was only recorded within the study area in the North Zone. The species was recorded roosting on an exposed rock platform within the lagoon. Suitable habitat for the species is limited within the subject land to a small area of beach habitat around the existing jetty in the North Zone (approximately 0.34 ha) which provides roosting and foraging resources. While the species may roost on beaches, the subject land comprises a very small area of beach habitat that is tidal and not considered to be preferred roosting habitat, particularly given absence of records of the species in these areas. As such, suitable habitat for the species is limited to a very small area of foraging habitat (approximately 0.34 ha) along the beach beside the existing jetty. The location of suitable habitat within the subject land and wider study area for the Wandering Tattler is shown in **Figure 32.** Potential habitat for the species may be reduced marginally, however these impacts are largely restricted to short-term impacts during construction of the marine infrastructure and foraging habitat within the lagoon will be available in the long-term with only a reduction of approximately 0.02 ha of habitat which will form part of the piled vessel ramp. Furthermore, significantly larger areas of more suitable habitat are available within the study area and wider locality.

The Double-banded Plover and Whimbrel were only recorded within the South Zone. These species were recorded roosting/foraging along the beach in the South Zone and were not recorded within the subject land. Although not recorded in the North Zone, suitable habitat for the species within the subject land is limited to a small area of beach habitat around the existing jetty (approximately 0.34 ha) which provides roosting and foraging habitat. While the species may roost on beaches, the subject land comprises a very small area of beach habitat that is tidal and not considered to be preferred roosting habitat, particularly given absence of records of the species in these areas. As such, suitable habitat for the species is limited to a very small area of foraging habitat (approximately 0.34 ha) along the beach beside the existing jetty. The location of suitable habitat within the subject land and wider study area for the Double-banded Plover and Whimbrel is shown in **Figure 33** and **Figure 34**, respectively**.** Potential habitat for these species may be reduced marginally, however these impacts

are largely restricted to short-term impacts during construction of the marine infrastructure and foraging habitat within the lagoon will be available in the long-term with only a reduction of approximately 0.02 ha of habitat which will form part of the piled vessel ramp. Furthermore, significantly larger areas of more suitable habitat are available within the study area and wider locality.

The Pacific Golden Plover was recorded within the study area on the exposed rocky platforms in the lagoon in the North Zone and along the beach within the South Zone. No individuals were recorded within the subject land. Suitable roosting and foraging habitat within the subject land is restricted to the small area of beach habitat around the existing jetty in the North Zone (approximately 0.34 ha), which provides potential roosting and foraging habitat. As such, suitable habitat for the species is limited to a very small area of foraging habitat (approximately 0.34 ha) along the beach beside the existing jetty. The location of suitable habitat within the subject land and wider study area for the Pacific Golden Plover is shown in **Figure 35**. Potential habitat for the species may be reduced marginally, however these impacts are largely restricted to short-term impacts during construction of the marine infrastructure and foraging habitat within the lagoon will be available in the long-term with only a reduction of approximately 0.02 ha of habitat which will form part of the piled vessel ramp. Furthermore, significantly larger areas of more suitable habitat are available within the study area and wider locality.

Table 11 Summary of habitat for known and potentially occurring migratory species within the study area and subject land

Common Name	Scientific Name	Occurrence Summary	Habitat Type	Study Area			Subject Land		
				North Zone	South Zone	Total	North Zone	South Zone	Total
Birds									
Wedge-tailed Shearwater	*Ardenna pacifica*	Known	Roosting and Breeding Habitat	0.43	0.00	0.43	0.06	0.00	0.06
Ruddy Turnstone	*Arenaria interpres*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34
Bar-tailed Godwit	*Limosa lapponica baueri*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34
Masked Booby	*Sula dactylatra*	Potential	Foraging Habitat	1.00	0.00	1.00	0.89	0.00	0.89
Common Noddy	*Anous stolidus*	Potential	Foraging Habitat	1.00	0.00	1.00	0.89	0.00	0.89
Wandering Tattler	*Tringa incana*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34
Double-banded Plover	*Charadrius bicinctus*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34
Pacific Golden Plover	*Pluvialis fulva*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34
Whimbrel	*Numenius phaeopus*	Potential	Foraging Habitat	1.13	1.07	2.19	0.34	0.00	0.34

6. Avoidance and Mitigation Measures

6.1. Avoidance Measures

The Project has been through several design iterations to ensure areas of highest ecological value have been avoided by the Project. Community consultation and co-design have been key driving factors for the Project given the unique location and needs of the island. During the design phase the Project team has undertaken genuine and transparent communication with the Lord Howe Island community as well as Government departments, including the LHIB, DPHI, DPIRD – Marine Parks and Agriculture and Biosecurity, Transport for NSW, NSW and Commonwealth DCCEEW. During this process, the Project team has been required to show innovative thinking in all aspects of the design options conceptual master planning. Furthermore, the Project has considered staging and requirements for the continued operation of the current WMF and marine freight service (MV Island Trader) until the Project has been completed and new services are operational.

Initial Project planning included the development of business cases for the marine infrastructure and the WMF which have been subject to several design iterations to minimise impacts to native vegetation and habitat whilst meeting the needs of the Project. These are detailed further below, while a comparison of the original disturbance footprint and the subject land is shown in **Figure 36**.

6.1.1. Marine Infrastructure and Biosecurity Facilities

The marine infrastructure business case assessed multiple options about the location of the marine infrastructure in consideration of the freight vessel, new wharf and cargo laydown areas. These options included sites within the North Zone, South Zone and at Blinky Beach on the eastern side of the island. Following the completion of detailed technical studies, as well as meetings with the Lord Howe Island Board, the South Zone was ruled out as a viable option for several reasons.

Primarily, it would be difficult to safely transfer cargo due to unpredictable tides and greater wave heights (when compared to the North), which would pose a greater risk to WHS during loading and unloading operations. Additionally, the South Zone required the design of infrastructure that was deemed of a higher impact, leading to higher costs, and no-back up option, should the infrastructure require maintenance or upgrade (unlike the North Zone where there is the lift-on lift-off alternative with the existing jetty).

The operational and environmental challenges were also significant, including excessive construction costs due to the required ramp length (over 172m) and the environmental impact by creating a new shipping channel. Community and government feedback further contributed to the decision, with concerns about visual impacts, reputational risks, and environmental damage. The South Zone was also less likely to meet environmental approvals due to the impact it would have on a pristine environment. In comparison, the North Zone was identified as a more feasible option, with the use of the existing channel which the current MV Island Trader navigates, and proposed development in an already disturbed (partly) area.

Once it was determined that the marine infrastructure would be located within the North Zone, further design options were prepared that explored how a new piled vessel ramp could be incorporated within the existing marine infrastructure include the existing jetty. This included:

- New piled vessel ramp north of the existing jetty;
- New angled piled vessel ramp north of the existing jetty, with the existing jetty partially removed;

- New piled vessel ramp immediately to the south side of the existing jetty; and
- New piled vessel ramp on the end of the existing jetty and replacing the deck of the existing jetty and strengthening as required.

The ongoing iterative design process has considered a number of design options that have incorporated and responded to the following general assumptions for the marine infrastructure and biosecurity facilities in the North Zone. The challenge is to ensure the competing demands of the site including marine and agency operations, recreation, tourism and the masterplan.

1. **Safety:** All design options are to ensure the final design prioritises the overall safety of residents, tourists and workers, with new and improved operational procedures as well as the upgrade to the existing staging area and cargo laydown. The proposed unloading area must be secured, so as not to allow public access, including tourists, to mix with operational activities when the freight vessel is docked (3 days per fortnight).
2. **Essential Marine Operations & Recreational Uses:** Existing marine operations are to remain as they are currently in the North Zone. In particular the Marine Rescue shed is to remain in operation at all times, as well as access to the public boat ramp, and access to the foreshore and beach.
3. **Protecting & Enhancing the Surrounding Environment:** Biosecurity practices will be enhanced through the design, and the existing jetty is incompatible with potential new methods of unloading. The new cargo laydown area will accommodate improvements for spill containment, avoiding environmental damage and contamination by both public and commercial users and improving the recreation experience along the foreshore and beach access.
4. **Retain Existing Scale & Character:** Retain the existing scale and character of the North Zone. The heritage-listed office building is an asset, and its original features should be preserved. The Norfolk Pines and jetty are a valuable landscape feature that should be incorporated into the final design option.

In addition to the above considerations, the Project has also been through multiple design changes to minimise impacts to native vegetation and habitat for threatened species. While some native vegetation is required to be removed to cater for the expanded hardstand and new piled vessel ramp, the Project will retain the majority of native vegetation within the North Zone, including larger patches of native vegetation as well as the dense shrubby vegetation along the foreshore and Norfolk Island Pine trees.

While the Project has identified a disturbance footprint for the marine infrastructure, this is considered to be the maximum area of disturbance required. Given further design changes are expected, efforts to retain additional native vegetation and habitat within the subject land will be undertaken.

6.1.2. Waste Management Facility

Design options for the WMF have been developed together with the consultant Project team including SMEC engineers, architect, landscape architect and the waste management team on the LHIB. The design process has also entailed comprehensive community feedback through on-island community engagement sessions and workshops. The iterative design process has considered a number of design options that have incorporated and responded to the following general assumptions for the facility.

- Construction of the building needs to be very simple and repetitive, ideally to allow for offsite fabrication and ease of assembly on-site;
- Visually it needs to be simple and recessive taking into consideration the view from the air;
- The activities within the WMF are progressive and should be in a single linear arrangement which conforms with the existing WMF footprint;
- The native vegetation and associated habitat are constraints that the facility needs to be designed around;
- The facility should be column free, if possible, to maximise flexibility and avoid damage from machinery (i.e. forklifts) moving around;
- There Is only room for a single road in and out; and
- The public are restricted to the drop-off area except through prior arrangement.

The preferred design option for the WMF within the South Zone, including the proposed dog kennel facility, has been refined since the initial concept plans, following the completion of vegetation mapping as well as other technical studies. Where possible, existing native vegetation has been retained, including vegetation on the eastern side of the WMF which will maintain the character around the site and help provide screening from scenic lookouts on the island (i.e. Transit Hill).

While the Project has largely been situated within previously cleared areas, the disturbance footprint has included areas of the South Zone that require remediation due to contamination. Many of these areas are only proposed to be impacted because of the remediation and are not required for the construction and operation of the WMF. As such, these areas will be revegetated in accordance with the Project's Landscape and Urban Design Plans and include replanting with only local provenance plant material grown on the island.

It is noted that within the South Zone, the subject land includes areas mapped as native vegetation along the existing access road. These areas comprise overhanging canopy from trees along the existing access road. No works are proposed to be undertaken along the existing access road, which will only be used in its current condition if required to transport equipment. Therefore, the Project will not impact the native vegetation or associated habitat along the existing access road.

6.2. Mitigation Measures

A range of mitigation measures will be implemented for the Project. These measures will be implemented to minimise the impacts of the Project on biodiversity values, and to promote ongoing management of native flora and fauna in accordance with current management plans that are implemented on Lord Howe Island. The following mitigation measures will be incorporated into a site-specific BMP that will be implemented to minimise any adverse effects of the Project on biodiversity:

- Vegetation Clearance and Fauna Management Protocols;
- Vegetation Management Plan including proposed landscaping and revegetation, and weed control measures; and

- Erosion, Sedimentation and Pollution Control.

In addition to these measures, inductions for contractors and visitors are recommended to address the locations of sensitive flora and fauna and outline their roles and responsibilities for the protection and/or minimisation of impacts to biodiversity values.

6.2.1. Vegetation Clearance and Fauna Management Protocols

6.2.1.1. Delineation of Clearing Areas

To avoid unnecessary removal or damage to the nearby vegetation, the clearing area (i.e. the subject land) should be clearly demarcated and signed, where appropriate to ensure no vegetation beyond these boundaries is removed.

Areas that require clearance will be flagged and clearly delineated with temporary fencing (or similar) to ensure that no areas beyond the subject land are inadvertently cleared during the construction process. No machinery will be parked on areas beyond the temporary fencing and no access will be allowed during construction. Ancillary facilities such as stockpile sites, site compounds and construction zones will not be located beyond the limits of clearing.

6.2.1.2. Timing of Clearing

Due to the presence of nesting sites for threatened and migratory birds within the subject land, vegetation clearance is to be undertaken outside of the key migration and breeding periods for threatened and migratory birds. This includes the threatened White Tern, as well as the migratory Wedge-tailed Shearwater, which are both known to nest and breed within the subject land over Spring/Summer (extending from October to May). Where possible, vegetation clearance should be undertaken between the months of June-August.

6.2.1.3. Tree Protection Measures

Tree protection measures are to be implemented for trees identified to be retained within the subject land and adjoining areas where structural root zones have the potential to extend into the subject land.

6.2.1.4. Pre-clearance Surveys

Pre-clearance surveys are to be undertaken by a suitably qualified ecologist. Pre-clearance surveys will include identification of key habitat features as well as searches for the Lord Howe Placostylus. Given the small area of habitat to be impacted, pre-clearance surveys should be undertaken immediately prior to vegetation clearance (1-2 days). The pre-clearance surveys will include:

- Demarcation of key habitat features such as nests, hollow-bearing trees, burrows, fallen logs and rock;
- Checking trees for the presence of bird within nests and/or microchiropteran bats within tree hollows;
- Checking logs and rocks for the presence of reptiles and the Lord Howe Placostylus;
- Animals found to be occupying trees and habitat will be safely removed before the clearing of trees and relocated into nearby vegetation;
- Survey and translocation of the Lord Howe Placostylus as detailed further in ***Section 6.2.1.3***.

- Provision of a report following the completion of a pre-clearance survey detailing the results, including locations of habitat features, fauna encountered and recommendations to minimise impacts on native fauna species during vegetation clearing.

6.2.1.5. Clearance Supervision

An ecologist should be present while clearing to capture and relocate animals encountered during the clearance operation, including species inadvertently injured. Provisions will be made to protect any native fauna during clearing activities by the following means:

- All persons working on the vegetation clearing will be briefed about the possible fauna present and should avoid injuring any present;
- Animals disturbed or dislodged during the clearance but not injured should be assisted to move to the adjacent retained vegetation or other specified locations; and
- If animals are injured during the vegetation clearance, the LHIB will be notified and if required the local vet contacted to assess the injured animal. Appropriate steps will be taken to treat the animal, however, if the animal is unlikely to survive, it will be humanely euthanised.

6.2.1.6. Fauna Handling Protocols

Fauna handling will be undertaken by experienced ecologists. Ecologists are responsible for capturing vertebrate fauna as well as the Lord Howe Placostylus, during the habitat clearing process. Ecologists employed to undertake pre-clearance surveys and clearance supervision will be required to hold the necessary licences to capture and relocate native fauna. Specific protocols for the handling of birds, reptiles and the Lord Howe Placostylus are to be developed and included within the Projects BMP.

6.2.1.7. Lord Howe Placostylus Translocation Plan

A translocation plan for the Lord Howe Placostylus is to be incorporated into the Project's BMP. The translocation plan is to be prepared in accordance with the NSW Policy for the Translocation of Threatened Fauna (DPIE, 2019)

During pre-clearance surveys targeted searches for the Lord Howe Placostylus are to be undertaken. Firstly, nocturnal active searches should be undertaken over a minimum of two consecutive nights to search for any active individuals. This will involve spotlighting surveys across transects within areas of suitable habitat in the subject land. Where individuals are encountered, they are to be captured and relocated as outlined in the sections below. Following the nocturnal active searches, all areas of leaf litter within the South Zone are to be manually raked, with the litter collected and distributed within retained areas of the study area. Given the clearing area within the South Zone is located along the edge of a large patch of vegetation to be retained, the litter should be raked back and spread out in the immediately adjoining areas.

An ecologist is to be present to supervise the removal of vegetation and associated habitat within the subject land in order to capture and relocate any individuals as required.

Although the Lord Howe Placostylus has not been recorded within areas of vegetation to cleared within the subject land, there is potential habitat to be removed. If the Lord Howe Placostylus is encountered during pre-clearance surveys or clearance supervision, the following procedures are to be followed.

a. Holding

All live individuals, along with a small amount of topsoil will be collected and placed into a container. Containers are to be enclosed with small air holes to allow for the movement of air in and out of the container. All individuals should be released on the same day of capture and not held overnight.

b. Relocation

Any individual snails captured are to be released into areas of suitable habitat within the study area, of which should be as close to the capture location as possible. A map of suitable relocation sites is to be included within the BMP.

6.2.2. Landscaping and Revegetation

Landscaping works will be undertaken within the subject land in accordance with the Project's Landscape and Urban Design Plans prepared by Spackman Mossop Michaels in association with Lahznimmo Architects (2025). The Landscape and Urban Design Plans includes a detailed planting plan that identifies areas of the subject land that will be subject to revegetation. All areas identified for landscaping will be revegetated with native species to re-establish native vegetation communities. The Landscape and Urban Design Plans provide a detailed planting schedule that includes the pot size, mature height and spread of species and the quantity proposed to be planted per square metre. The procurement of native plantings will be from the local nursery on Lord Howe Island, and consultation has already been undertaken to ensure plants will be available for planting based on the Project schedule.

The BMP is to identify performance targets along with maintenance, monitoring and reporting requirements to ensure the success of revegetation within landscaped areas.

6.2.3. Weed Management

On Lord Howe Island, weeds are prioritised and categorised as part of the *North Coast Local Land Services Regional Strategic Weed Management Plan 2023 – 2027* (North Coast Local Land Services, 2022). However management priorities to demonstrate compliance with the general biosecurity duty are identified in the Lord Howe Island Weed Management Strategy (LHIB, 2016) and EIS Chapter 6.13 Biosecurity.

In order to minimise the spread of weeds throughout the subject land and adjoining areas, appropriate weed control activities will be undertaken in accordance with the Lord Howe Island Weed Management Strategy (LHIB, 2016). The following goals and strategies are identified in the Weed Management Strategy which will deliver best practice weed management outcomes on Lord Howe Island and are to be considered in developing weed management measures.

i. Goal 1 – Exclude: Prevent the establishment of new invasive weeds

Identification of high-risk pathways and interception of high-risk species. Appropriate construction site hygiene measures will be implemented to prevent entry of new weeds to the area such as the cleaning of equipment prior to transport to Lord Howe Island.

A wash down station is to be established and all construction entering and leaving the site will be required to be washed down to prevent weed seeds entering or leaving the site. These procedures will also assist in preventing the introduction and spread of *Phytopthora cinnamomi*, which is a pathogen of native vegetation that is carried in contaminated soil.

ii. Goal 2 – Eradication: Eliminate or prevent the spread of invasive weeds

Initial weed management will be carried out within the subject land according to best-practice methods. The targeted species include those listed in Appendix A of the Weed Management Strategy. Initial weed treatment will include eliminating woody species and targeting large dominant infestations of exotic understorey species (grasses and herbs). This may be achieved via a combination of manual weed removal and herbicide use.

Weed management measures should avoid adverse impacts to retained vegetation within the subject land, including not over clearing (remove only targeted species), employment of minimal disturbance techniques to avoid soil and surrounding vegetation disturbance.

iii. Goal 3 – Manage effectively: Reduce the impact of widespread, non-eradicable invasive weeds

Eradication is not considered to be possible for many of the weeds identified on Lord Howe Island, and given many of these do not pose a significant risk to biodiversity on Lord Howe Island, control of these species should focus on containment. Follow-up monitoring and maintenance should be undertaken in the subject land following vegetation clearing activities, to contain any re-emergence of weed species.

iv. Goal 4 – Build capacity: Ensure that Lord Howe Island has the ability and commitment to manage invasive weeds and to promote awareness of invasive weeds within the community.

Weed management is to be undertaken by competent, skilled and motivated weed-eradication staff. Where necessary, consultation with the LHIB and community members may be required to gain local knowledge.

Maintenance, monitoring and reporting requirements along with responsibilities to ensure weed management measures are implemented are to be identified in the Projects BMP.

The LHIB currently implements a Weed Eradication Program (WEP) in accordance with the Weed Management Strategy, which proposes the eradication of at least 25 priority invasive weeds that occur on Lord Howe Island.

6.2.4. Erosion, Sedimentation and Pollution Control

Potential impacts to terrestrial flora and fauna, as well as marine ecology within the lagoon, occurring in the construction phase that can be managed include: run-off, sedimentation, erosion and pollution. To reduce sedimentation on the construction site, erosion control measures should be implemented. This includes minimising the area of soil exposed on the site at any given time. All soil stockpiles should be adequately covered when not in use to prevent erosion from heavy rainfall. Sediment fences should be established around the perimeter of the development area to prevent the impacts of sedimentation on the adjoining areas. During

development, precautions should be taken to ensure that no pollution, such as petrochemical substances or water containing suspended solids, escapes the construction site. Pollution traps and efficient removal of pollution to an off-site location would help to minimise pollution impacts.

6.2.5. Speed Limits and Signage (Construction)

As outlined in ***Section 9.7.5*** speed limits will be enforced and signage installed to minimise risk of vehicle strikes on native fauna species. Several species including the Lord Howe Island Woodhen and Wedge-tailed Shearwater are frequently encountered on roads and within hardstand areas and the enforcement of speed limits will reduce the chances of vehicle strike. A maximum speed of 25km/hr applies to roads on Lord Howe Island, which minimises the risk of vehicle strikes along existing access roads during construction, whilst also ensuring personal safety. Speed limits will also be enforced for the Project to reduce the risk of vehicle strike Further details on vehicle speeds and mitigation measures are provided in the Transport and Traffic Assessment (Amer Organisation, 2025).

Whilst managing speed limits will largely reduce the risk of vehicle strike, signage is to be installed to warn motorists of the fauna that may be present on roads and within operational areas. Signage will be consistent with existing signage on Lord Howe Island, including the identification of the Lord Howe Island Woodhen and Mutton Birds such as the Wedge-tailed Shearwater.

7. Conclusion

This FFA has been prepared in accordance with the Project SEARs to support the Biodiversity Development Assessment Report in assessing the terrestrial biodiversity impacts of the Project. The Project involves the construction, operation and maintenance of new marine infrastructure, cargo handling facility, biosecurity infrastructure and waste management facility on Lord Howe Island, and associated landscape and vegetation restoration.

The Project seeks development consent as CSSI under Division 5.2, subdivision 5.13 of the EP&A Act. The Project is a controlled action (2025/10188) under the EPBC Act 1999 and will be assessed under the bilateral agreement between the NSW and Commonwealth Governments.

Under the BC Act, CSSI Projects requiring development consent under Part 5.13 of the EP&A Act must be assessed using the BAM with the results presented in a BDAR, However, as outlined in Section 1.5 of the BAM (2020), the BAM does not apply to biodiversity that is endemic to Lord Howe Island and therefore a number of sections within the BDAR cannot be prepared strictly in accordance with the BAM. As such, this FFA has provided additional assessment of biodiversity values within the subject land and wider study area.

The classification of vegetation communities has been undertaken in accordance with the community profiles identified in the 2016 floristic study (Sheringham et al., 2016a). Several areas within the study area have shown evidence of recent regeneration which has resulted in redefining the boundaries of the vegetation communities present. A total of ten native vegetation communities were identified within the subject land. None of the vegetation communities within the subject land were a TEC listed under the BC Act or EPBC Act.

No threatened flora species were recorded within the subject land and none are considered likely to occur. Seven threatened fauna species were identified within the subject land and a further six threatened fauna species were identified within the study area and considered to have the potential to occur within the subject land. Furthermore, one migratory species has been identified within the subject land, while a further eight migratory species are considered to have the potential to occur.

The Project has been through several design iterations to avoid and minimise impacts for threatened and migratory species while still meeting the construction and operation requirements for the Project. Where avoidance of native vegetation was not possible, mitigation measures have been proposed to minimise and manage the impacts to biodiversity values, such as delineation of clearing areas, timing of clearing, tree protection measures, pre-clearance surveys, clearance supervision, fauna handling protocols, a translocation plan, landscaping and revegetation, weed management, erosion and sediment management and speed limits and signage.

An assessment of the impacts from the Project on threatened and migratory species concluded that the Project is unlikely to result in a significant impact on any of the assessed species.

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APPENDIX A :
Likelihood of Occurrence Assessment

Table 12 Threatened flora likelihood of occurrence table

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Caesalpinia bonduc	Knicker Nut	E	-	5	-	The NSW BioNet Atlas holds five records of the species within the locality, none of which are located within the study area. The nearest record is located to the northern east of the study area within a residential lot.	The species is only found in the northern part of Lord Howe Island, in the vicinity of Ned's Beach and near Old Settlement Beach. This species grows on sandy, coral-derived soil close to the shoreline, in coastal scrub vegetation, in full sun or light shade.	Moderate likelihood of occurrence. Previous records are predominantly on the north eastern side of the island around Ned's, beach, however, there has been one previous record in proximity to the subject land. Potential habitat is available within the North Zone, although the vegetation within the North Zone has largely been subject to previous disturbance and not considered to be optimal. Furthermore, targeted threatened species surveys were undertaken within the study area and the species was not detected.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Calystegia affinis	Lord Howe Island Morning Glory	CE	CE	7	X	The NSW BioNet Atlas holds seven records of the species within the locality, none of which are located within the study area. Previous records are located nearby Old Settlement Beach, and on Mt Lidgbird. One additional record is from a transplanted cutting that is growing by the Lord Howe Island Board office. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	On Lord Howe Island the species occurs in two different habitats, in lowland areas of Dawsons Ridge in the northern part of the island and high in the southern mountains on Mt Lidgbird. Both habitats are on basalt-derived soils.	Low likelihood of occurrence. The study area is not within the known distribution of the species on Lord Howe Island and the subject land is not considered to provide suitable habitat. Furthermore, targeted threatened species surveys were undertaken within the study area and the species was not detected.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Carmichaelia exsul	Lord Howe Island Broom	CE	-	19	-	The NSW BioNet Atlas holds 19 records of the species within the locality, with all records located on Mt Lidgbird and Mt Gower within the Permanent Park Reserve.	The species occurs between 300 - 500 m altitude. It is often found at the base of cliffs and grows in Mountain Rose - Fitzgeraldii forest, Mountain Palm forest and mixed fern and herb vegetation.	Low likelihood of occurrence. The study area is located at elevations well below 100m and outside of the range which the species occurs. Furthermore, the study area does not comprise vegetation communities associated with the species. Targeted surveys within the study area did not detect the species.
Chamaesyce psammogeton	Sand Spurge	E	-	72	-	The NSW BioNet Atlas holds 72 records of the species within the locality, with all records located on coastal dunes along Blinky Beach.	Grows on fore-dunes, pebbly strandlines and exposed headlands, often with Spinifex (*Spinifex sericeus*) and Prickly Couch (*Zoysia macrantha*)	Moderate likelihood of occurrence. The species was not recorded during targeted surveys within the study area however potential habitat is available within the South Zone in the vegetation community Coastal Spinifex – Dune Bean – Club Rush – Melanthera biflora – Saltwater Couch beach strandline grassland. Previous records of the species have

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
								recorded within the same vegetation community at Blinky Beach to the east of the study area.
Coprosma inopinata	Small-leaved Currant Bush	E	-	7	-	The NSW BioNet Atlas holds seven records of the species within the locality, all located at high elevations on Mt Lidgbird and Mt Gower within the Permanent Park Reserve.	The species is only found in the southern mountains of Lord Howe Island. It is restricted to the narrow, exposed south-westerly or south-easterly ridges of Mount Lidgbird and Mount Gower, and nearby more sheltered pockets.	Low likelihood of occurrence. The study area is not within the known distribution of the species on Lord Howe Island with all previous records within the southern mountains. The study area does not comprise suitable habitat for the species. Furthermore, targeted threatened species surveys were undertaken within the study area and the species was not detected.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Geniostoma huttonii	Hutton's Geniostoma	E	E	37	X	The NSW BioNet Atlas holds 37 records of the species within the locality, all located at high elevations on Mt Lidgbird and Mt Gower within the Permanent Park Reserve. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	This species only occurs on Lord Howe Island where it is mainly found on remote ridges of Mount Gower and Mount Lidgbird in the southern mountains. The species occurs in rainforest, Curly Palm forest and scrub on the south and east-facing shaded cliffs in amongst open, stunted shrubs, or in shade. Dominant species within the habitat include Blue Plum (*Chionanthus quadristamineus*), Mountain Rose (*Metrosideros nervulosa*) and	Low likelihood of occurrence. The study area is not within the known distribution of the species on Lord Howe Island with all previous records within the southern mountains. The study area does not comprise suitable habitat for the species. Furthermore, targeted threatened species surveys were undertaken within the study area and the species was not detected.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							Fitzgeraldii (Dracophyllum fitzgeraldii)	
Hypolepis elegans	(blank)	CE	-	5	-	The NSW BioNet Atlas holds five records of the species within the locality, all located at high elevations on Mt Lidgbird and Mt Gower within the Permanent Park Reserve.	*Hypolepis elegans* occurs in open spaces on forest margins.	Low likelihood of occurrence. The study area is not within the known distribution of the species on Lord Howe Island with all previous records within the southern mountains. Furthermore, targeted threatened species surveys were undertaken within the study area and the species was not detected.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Lepidorrhachis mooreana	Little Mountain Palm	CE	CE	21	X	The NSW BioNet Atlas holds 21 records of the species within the locality, all located at high elevations on Mt Lidgbird and Mt Gower within the Permanent Park Reserve. The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	The species is restricted to the cloud forest vegetation at the summits of Mt Gower and Mt Lidgbird above an elevation of approximately 740 m.	Low likelihood of occurrence. The study area is located at elevations well below 100m and outside of the range which the species occurs. Furthermore, the study area does not comprise vegetation communities associated with the species. Targeted surveys within the study area did not detect the species.
Polystichum moorei	Rock Shield Fern	E	E	6	X	The NSW BioNet Atlas holds six records of the species within the locality, all located on Mt Gower and Mt Lidgbird within the Permanent Park Reserve. The EPBC PMST identifies that the species or species	Rock Shield Fern is only found in the southern part of Lord Howe Island, mostly in the mountains, with one population close to the beach. Rock Shield Fern grows on rocks in overhanging caves on basalt cliffs and	Low likelihood of occurrence. The study area does not contains suitable habitat in the form of rocks and caves on basalt cliffs. Furthermore, targeted surveys within the study area did not detect the species.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						habitat is likely to occur within the 5km locality.	on coral-derived sedimentary rock.	
Xylosma parvifolia	Mountain Xylosma	E	E	6	X	The NSW BioNet Atlas holds six records of the species within the locality, with all records located on Mt Gower and Mt Lidgbird within the Permanent Park Reserve. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	This plant is only found on exposed, remote parts of the southern mountains of Lord Howe Island. It grows mostly amongst dense, stunted vegetation on cliffs and ridges, and also in low numbers in Cloud Forest on Mt Lidgbird and Mt Gower. The species habitat is very steep and exposed.	Low likelihood of occurrence. The study area is not within the known distribution of the species on Lord Howe Island with all previous records on mt Lidgbird and Mt Gower. The study area does not comprise suitable steep and exposed habitats favoured by the species. Furthermore, targeted threatened species surveys were undertaken within the study area and the species was not detected.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Anthosachne kingiana subsp. kingiana	Phillip Island Wheat Grass	CE	CE	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	On Lord Howe Island the species occurs at the intergrade between exposed basalt-derived rocky cliffs and a shrub zone that merges into littoral rainforest. The species occurs in association with several grasses and herbs including *Dichelachne crinita* (Longhair Plumegrass), *Poa poiformis, Senecio howeanus, Sporobolus virginicus* (Sand Couch) and *Tetragonia tetragonioides* (New Zealand Spinach) along with several	Low likelihood of occurrence. The Species Profile and Threats Databased describes the species as being located in the north of the island, however the NSW BioNet atlas holds no records of the species within the locality. Although some marginal habitat is available within the North Zone, targeted searches were undertaken within the study area and the species was not detected.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							shrub species, including *Cassinia tenuifolia* (Bully Bush), *Dodonaea viscosa* (Hopwood), *Leucopogon parviflorus*, *Melaleuca howeana* (Tea Tree) and *Melanthera biflora*.	

Table 13 Threatened and migratory fauna Likelihood of occurrence table

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Birds								
Actitis hypoleucos	Common Sandpiper	-	M	6	X	The NSW BioNet Atlas holds six records of the species within the locality, one of which occurs within the North Zone. No records are located within the South Zone, with the closest record, on the northern side of the airport adjacent to Blinky Beach. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	This species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The species feeds for extensive periods in grasslands consuming terrestrial prey, though riverine areas are also utilised. The species eats molluscs such as bivalves, crustaceans such as amphipods and crabs and a variety of insects. Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves. The species does not breed in Australia.	Moderate likelihood of occurrence. The species may utilise the habitats within the subject land for foraging on occasion however very limited habitat is available. The North Zone provides a small area of potential roosting habitat on the rocks around the existing wharf, however these are subject to inundation at high tide. The species has not been recorded during

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
								targeted surveys in December 2024 or January and February 2025, suggesting that the species does not rely on habitat within the North Zone for roosting. No suitable roosting habitat is present within the South Zone.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Anous stolidus	Common Noddy	-	M	253	X	The NSW BioNet Atlas holds 253 records of the species within the locality. The majority of records are located from within the northern portion of the island with a few scattered records along the southern coastlines. The species has been recorded within the both the North and South Zones. The EPBC PMST identifies that the breeding is known to occur within the 5km locality.	The species occurs on or near islands, on rocky islets and stacks with precipitous cliffs, or on shoals or cays of coral or sand. The species feeds mainly on fish, although they are known to also take squid, pelagic molluscs, medusae, aquatic insects and even Pandanus fruit. During the non-breeding period, the species occurs in groups throughout the pelagic zone. The species is known to breed on Lord Howe Island with many nests built on cliff ledges.	High likelihood of occurrence. The species has been recorded within the study area during targeted surveys. The species was recorded flying through the South Zone although was not recorded within the subject land. A small are of habitat in the form of sandy beaches and rocky outcropping is present within the subject land, although the species was not recorded utilising these habitats during surveys. As such, the species is

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
								not considered to rely on these features. Furthermore, the roosting habitat within the subject land is considered to be temporary as it is subject to inundation during high tides. No suitable breeding habitat is present within the study area. No foraging habitat in the form of open pelagic waters are present within the study area, however potential foraging habitat is present within the larger Project Area which

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
								includes areas of the lagoon.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Apus pacificus	Fork-tailed Swift	-	M	1	-	The NSW BioNet Atlas holds one records of the species within the locality. The EPBC PMST does not identify habitat within the 5km locality	The Fork-tailed Swift is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher. The species mostly occurs over inland plains, open habitats, riparian woodland, tea-tree swamps, and occasionally above foothills or in coastal areas. They also occur over settled areas, including towns, urban areas and cities. The species forages aerially, often in updraughts, near cliffs. This species prefers foraging above dry and open habitats. The species is likely to roost aerially, but are occasionally observed to land. The species does not breed in Australia.	Low likelihood of occurrence. Although potential overfly habitat is available within the study area, the species is a rare visitor to Lord Howe Island and would not utilise the habitat within the study area.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Ardenna carneipes	Flesh-footed Shearwater	V	M	1135	X	The NSW BioNet Atlas holds 1135 records of the species within the locality. The majority of records are located from within the northern portion of the island around Neds Beach and Transit Hill and south to Intermediate Hill. The EPBC PMST identifies that the breeding is known to occur within the 5km locality.	The Flesh-footed Shearwater mainly occurs in the subtropics over continental shelves and slopes and occasionally inshore waters. Individuals also pass through the tropics and over deeper waters when on migration. This is a marine species that nest on Lord Howe Island in forests on sandy soils from Ned's Beach to Clear Place, with smaller colonies below Transit Hill and at Old Settlement Beach.	High likelihood of occurrence. The species was not recorded during surveys, however, on Lord Howe Island, the species is known to have similar roosting requirements and share roost sites with the Wedge-tailed Shearwater, which was recorded roosting within the North Zone. Therefore suitable roosting habitat is present within the North Zone. Roosting habitat is present within the South Zone, however the

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
								species, or other shearwater species, was not recorded within the South Zone and therefore is not expected to utilise habitats within the South Zone for roosting. No foraging habitat in the form of open pelagic waters are present within the subject land. Potential foraging habitat is present within the larger Project Area which includes areas of the lagoon.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Ardenna grisea	Sooty Shearwater	-	V, M	2	X	The NSW BioNet Atlas holds two records of the species within the locality, both of which are located to the east of the South Zone. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	The Sooty Shearwater forages in pelagic (open ocean) sub-tropical, sub-Antarctic and Antarctic waters. The species moves to the southern hemisphere during the breeding season. . The species often nests in very dense colonies in a diverse range of habitats, from forested coastal islands to open tussock grasslands and fellfield on subantarctic islands.	Low likelihood of occurrence. Lord Howe Island is well surveyed and only two previous records occur within the locality. Furthermore, no known breeding colonies occur on the island. As the species is known to nest in dense colonies, the absence of records indicates species does not rely on the habitat available within the study area or wider locality. No foraging habitat in the form of open pelagic waters are

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
								present within the subject land or study area. Potential foraging habitat is present within the larger Project Area which includes areas of the lagoon.
Ardenna pacifica	Wedge-tailed Shearwater	-	M	218	X	The NSW BioNet Atlas holds 218 records of the species within the locality. Previous records are predominantly within the northern portion of the island and as far south as Intermediate Hill. The EPBC PMST identifies that the species or species habitat is known to	The Wedge-tailed Shearwater is a pelagic, marine bird known from tropical and subtropical waters. The species tolerates a range of surface-temperatures and salinities, but is most abundant where temperatures are greater than 21 °C and salinity is greater than 34.6 %. The Wedge-tailed Shearwater breeds colonially and is rarely seen	Known to occur. The species is known to breed within the North Zone and was recorded during targeted surveys. Potential roosting habitat is also available within the South Zone, however the species was not recorded roosting

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						occur within the 5km locality.	alone during this period. The species breeds throughout its known range, mainly on vegetated islands, atolls and cays, but one colony is known on the Australian mainland. The species is known to breed on Lord Howe Island, specifically on Mutton Bird Island.	in the South Zone. The species is considered likely to transit aerially across the subject land and wider study area however as the species forages in open pelagic waters, the subject land does not provide suitable foraging habitat for the species. Potential foraging habitat is present within the larger Project Area which includes areas of the lagoon.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Ardenna tenuirostris	Short-tailed Shearwater	-	M	1	-	The NSW BioNet Atlas holds one record of the species within the locality along the coast to the east of Transit Hill. The EPBC PMST does not identify habitat for the species within the 5km locality.	This species breeds on Tasmanian offshore islands and off the coast of southern Australia, with the bulk of the population in the south-east. Breeding occurs mainly on coastal islands, typically in areas of grassland or other vegetation, but sometimes cliffs or bare ground. Its diet includes fish, crustaceans and squid. Feeding occurs in very large flocks and it regularly feeds in association with other shearwaters, petrels, gannets and terns.	Low likelihood of occurrence. Lord Howe Island is well surveyed and only one previous record occurs within the locality. Furthermore, no known breeding colonies occur on the island. The species breeds and forages in dense flocks and the absence of records indicates that the species does not rely on the habitat available within the study area or wider locality. As such, the subject land and wider study area are not considered

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
								to comprise breeding or foraging habitat for the species.
Arenaria interpres	Ruddy Turnstone	-	V, M	423	-	The NSW BioNet Atlas holds 423 records of the species within the locality, including both the North and South Zones. Previous records are located predominantly from the Gold Course in the south to the northern end of the island, with a high number of records at the Lord Howe Island	The species is mainly found on coastal regions with exposed rock coast lines or coral reefs. It also lives near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. The species forages between lower supralittoral and lower littoral zones of foreshores, from strand-line to wave-zone. The Ruddy Turnstone roosts on beaches, above the tideline, among rocks,	High likelihood of occurrence. The species is unlikely to utilise the subject land and wider study area for roosting as the beaches are subject to inundation at high tide with very limited sand remaining above the high tide line. Furthermore, the species does not

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						Airport. The EPBC PMST does not identify habitat for the species within the 5km locality.	shells, beach cast seaweed or other debris. The Ruddy Turnstone does not breed in Australia (DCCEEW 2024h).	breed in Australia and therefore the subject land does not provide breeding habitat. The species has not been recorded within the subject land, however has been recorded foraging within the study area, both within the North Zone and South Zone along the sandy beaches on the waters edge.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Botaurus poiciloptilus	Australasian Bittern	E	E	1	-	The NSW BioNet Atlas holds one record of the species within the locality from 1987. This record is located to the north-east of the Lord Howe Island Airport. The EPBC PMST does not identify habitat for the species within the 5km locality.	The Australasian Bittern occurs mainly in freshwater wetlands and, rarely, in estuaries or tidal wetlands. It favours wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and reeds or cutting grass (Gahnia) growing over a muddy or peaty substrate. The species nests adjacent to relatively deep, densely vegetated freshwater swamps and pools, building its nests under dense cover	Low likelihood of occurrence. Lord Howe Island is well surveyed and only one previous record occurs within the locality. The species is typically found in association with freshwater wetlands which are not present within the study area. The small section of Cobbys Creek within the South Zone provides a potential tidal watercourse, however, does not contain dense vegetation for foraging or nesting.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							over shallow water. The nest is a shallow structure of dry or green reeds, within a clump of reeds in water or a swamp and is built on a platform of bent-over reeds.	As such, the subject land is not considered to comprise suitable habitat for the species.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Calidris acuminata	Sharp-tailed Sandpiper	-	V, M	12	X	The NSW BioNet Atlas holds 12 records of the species within the locality. The majority of records are located to the east of the Lord Howe Island Airport, as well as sole records at North Beach, Old Settlement Beach and Transit Hill. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	This species prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. They forage at the edge of the water of wetlands or intertidal mudflats, either on bare wet mud or sand, or in shallow water. Roosting occurs at the edges of wetlands, on wet open mud or sand, in shallow water, or in short sparse vegetation, such as grass or saltmarsh. The Sharp-tailed Sandpiper does not breed in Australia.	Moderate likelihood of occurrence. The species has not been recorded within the subject land or study area, however has been recorded in surrounding areas. Only marginal habitat is available for the species. Given Lord Howe Island has been well surveyed and only 12 records occur within the locality, the subject land is not considered to be relied upon by the species. Nevertheless, the sandy beaches

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
								within the subject land and wider study area provide potential foraging habitat.
Calidris canutus	Red Knot	-	V, M	3	X	The NSW BioNet Atlas holds three records of the species within the locality. One record is located within the Lord Howe Island Airport, one record on Blinky Beach, and one off the east coast. The EPBC PMST identifies that the species or species habitat is known to	The Red Knot mainly inhabits intertidal mudflats, sandflats and sandy beaches of sheltered coasts and sometimes on sandy ocean beaches or shallow pools on exposed rock platforms. They have also been recorded on terrestrial saline wetlands near the coast. The species is known to forage near the edge of water on intertidal mudflats and sand flats, as well as sewage ponds, and nearby	Moderate likelihood of occurrence. The species has not been recorded within the subject land or study area, however has been recorded in surrounding areas. Only marginal habitat is available for the species, predominantly in the form of

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						occur within the 5km locality.	lakes. The species roosts on sandy beaches, spits and islets, and mudflats. The species prefer to roost in open areas far away from potential cover for predators, but close to feeding grounds. The species does not breed in Australia.	foraging habitat along the shoreline. Given Lord Howe Island has been well surveyed and only three records occur within the locality, the subject land is not considered to be relied upon by the species.
Calidris ferruginea	Curlew Sandpiper	E	CE, M	13	X	The NSW BioNet Atlas holds 13 records of the species within the locality. This includes two records at North Beach, four at Old Settlement Beach, three at Transit Hill and the remaining records around the Lord Howe Island Airport.	The Curlew Sandpiper mainly occurs on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. Main requirements for feeding habitats are the presence of mudflats or shallow water	High likelihood of occurrence. The species has not been recorded within the subject land or study area, however has been recorded in surrounding areas. Suitable foraging and roosting habitat is available within the subject

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	up to 60 mm. The Curlew Sandpiper may also forage in low sparse emergent vegetation, such as saltmarsh, and sometimes forage in flooded paddocks or inundated saltflats. Roosting occurs in open situations with damp substrate, especially on bare shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands. The species does not breed in Australia.	land along the sandy beach.
Calidris melanotos	Pectoral Sandpiper	-	M	19	-	The NSW BioNet Atlas holds 19 records of the species within the locality. The majority of records are located on Blinky Beach, with the exception of one	The species prefers shallow fresh to saline wetlands. It is also found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial	Moderate likelihood of occurrence. The species has not been recorded within the subject land or study area, however has been

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						record within the Lord Howe Island airport, one record on Transit Hill and one record within the main settlement to the north. The EPBC PMST does not identify habitat for the species within the 5km locality.	wetlands. The species forages in shallow water or soft mud at the edge of wetlands. Roosting habitat occurs in proximity to foraging habitat. The Pectoral Sandpiper does not breed in Australia.	recorded in surrounding areas. The subject land does not comprise preferred wetland habitats for roosting or foraging habitat, however the sand beach habitats within the subject land provide some potential foraging habitat for the species.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Calidris ruficollis	Red-necked Stint	-	M	57	-	The NSW BioNet Atlas holds 57 records of the species within the locality. The majority of records are located within the Lord Howe Island airport and Blinky Beach, but extending north to North Beach. The EPBC PMST does not identify habitat for the species within the 5km locality.	The species is mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. The species mostly forages on bare wet mud on intertidal mudflats or sandflats, or in very shallow water; mostly in areas with a film of surface water and mostly close to edge of water. The species roosts on sheltered beaches, spits, banks or islets, of sand, mud, coral or shingle, sometimes in saltmarsh or other vegetation. The Red-necked Stint does not breed in Australia.	High likelihood of occurrence. The species has not been recorded within the subject land or study area but has been recorded in surrounding areas. Suitable foraging and roosting habitat is available within the subject land along the sandy beaches.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Calidris subminuta	Long-toed Stint	-	M	1	-	The NSW BioNet Atlas holds one record of the species within the locality. This record is at the northern end of Blinky Beach. The EPBC PMST does not identify habitat for the species within the 5km locality.	the Long-toed Stint occurs in a variety of terrestrial wetlands. They prefer shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. The species is also fond of areas of muddy shoreline, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire. It has also been observed at open, less vegetated shores of larger lakes and ponds and is common on muddy fringes of drying ephemeral lakes and swamps. The Long-toed Stint also frequents permanent wetlands such as	Low likelihood of occurrence. Lord Howe Island is well surveyed and only one previous record occurs within the locality. The species prefers wetland which are not present within the subject land or study area, however is also known to occur at tidal estuaries. Given the low number of records, the species is not considered likely to occur within the small area of marginal foraging habitat available.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							reservoirs and artificial lakes. They are uncommon, but not unknown, at tidal estuaries, saline lakes, salt ponds and bore swamps. The species does not breed in Australia.	

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Calidris tenuirostris	Great Knot	V	CE, M	1	-	The NSW BioNet Atlas holds one record of the species within the locality. This record is at North Beach. The EPBC PMST does not identify habitat for the species within the 5km locality.	The Great Knot inhabits sheltered coastal habitats, including inlets, harbours and estuaries. The species prefers habitats with large intertidal mudflats or sand flats. It has also been recorded on rock platforms, ponds in salt works, swamps near the coast, and salt lakes. The species is known to forage in areas of mud for invertebrates. Roosting habitat for the Great Knot is mainly shallow water in close proximity to feeding grounds. The species does not breed in Australia.	Low likelihood of occurrence. Lord Howe Island is well surveyed and only one previous record occurs within the locality. Suitable habitat in the form of sand-flats and mudflats are not available within the subject land.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Charadrius bicinctus	Double-banded Plover	-	M	-	-	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST does not identify habitat for the species within the 5km locality.	The Double-banded Plover is found on littoral, estuarine and fresh or saline terrestrial wetlands and also saltmarsh, grasslands and pasture. It occurs on muddy, sandy, shingled or sometimes rocky beaches, bays and inlets, harbours and margins of fresh or saline terrestrial wetlands such as lakes, lagoons and swamps, shallow estuaries and rivers. The species is sometimes associated with coastal lagoons, inland saltlakes and saltworks. It is also found on seagrass beds, especially Zostera, which, when exposed at low tide, remain heavily saturated or have numerous water-filled depressions. This species	High likelihood of occurrence. Potential habitat is available within the subject land and study area. The species was recorded in the study area although only on a single occasion within the North Zone and was not recorded within the subject land.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							sometimes utilises kelp beds.	
Charadrius leschenaultii	Greater Sand-plover	V	V, M	2	X	The NSW BioNet Atlas holds two records of the species within the locality, with one at North Beach and one at Old Settlement Beach. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	The Greater Sand Plover inhabits coastal littoral and estuarine environments, and is mainly found on sandy or muddy beaches with intertidal mudflats or sandbanks, rock platforms, inshore reefs or sand cays on coral reefs. The species forages visually over the surface of the substrate or just below the surface. It prefers to forage in areas	Low likelihood of occurrence. Suitable habitat for the species is available within the subject land along the coastal fringe. However, Lord Howe Island has been well surveyed and only a low number of records

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							that have low densities of other foraging shorebirds. The Greater Sand Plover usually roosts on banks, sand-spits, beaches, or in tidal lagoons. They are also known to roost on rocky points and in salt marshes. This species does not breed in Australia.	occur within the locality.
Charadrius mongolus	Lesser Sand-plover	V	E, M	12	-	The NSW BioNet Atlas holds 12 records of the species within the locality. The majority of records are located around the Lord Howe Island Airport, and near North Beach. The EPBC PMST does not identify habitat within the 5km locality.	In non-breeding grounds in Australia, this species usually occurs in coastal littoral and estuarine environments. It 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. It also sometime occurs in short saltmarsh or among mangroves. The	Low likelihood of occurrence. Despite some potential foraging and roosting habitat within the subject land along the sandy beaches, the species is considered to have a low likelihood of occurrence. Lord Howe Island is well surveyed, and there

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							species also inhabits saltworks and near-coastal saltpans, brackish swamps and sandy or silt islands in river beds. It is not known to breed in Australia.	are no records of the species in BioNet since 2003.
Charadrius veredus	Oriental Plover	-	M	9	-	The NSW BioNet Atlas holds nine records of the species within the locality, with all records located east of the study area at the Lord Howe Island Airport and Blinky Beach. The EPBC PMST does not identify habitat within the 5km locality.	The Oriental Plover is known to spend several weeks in coastal areas when first arriving in northern Australia, and then eventually moves further inland. The species prefers flat, open, grasslands with areas of bare ground or areas recently burnt, including dry paddocks or clay pans. The species has also been sighted near	Moderate likelihood of occurrence. Although the species has previously been recorded within the study area, this was at the airport within exotic grasslands. Other records are also located within nearby exotic

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							terrestrial wetlands and in salt marshes. The species is usually found foraging in short grass or on stony bare ground. It is also known to feed on mudflats and on beaches with beach cast seaweed. Oriental Plovers roost on wet mud, near the shallow water of beaches, and in salt marshes or paddocks. The species does not breed in Australia.	grasslands and in the wetland to the east of the South Zone. Exotic grassland within the South Zone my provide suitable habitat for the species, however given the low number of records, it is expected to be rare visitor to Lord Howe Island.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Chlidonias leucopterus	White-winged Black Tern	-	M	7	-	The NSW BioNet Atlas holds seven records of the species within the locality. This includes five records to the east of the study area and two records immediately south of the study area. The EPBC PMST does not identify habitat within the 5km locality.	In Australia, and elsewhere in their non-breeding range, the species mostly inhabits fresh, brackish or saline, and coastal or subcoastal wetlands. The species frequent tidal wetlands, such as harbours, bays, estuaries and lagoons, and their associated tidal sandflats and mudflats. Terrestrial wetlands, including swamps, lakes, billabongs, rivers, floodplains, reservoirs, saltworks, sewage ponds and outfalls are also inhabited. Wetlands may be open, or with floating emergent or marginal vegetation. The White-winged Black Tern is an opportunistic forager, feeding mainly on aquatic	Moderate likelihood of occurrence. The species has not been recorded within the subject land or study area, however has been recorded in surrounding areas to the east. All records are from pre 2007. Despite the nearby records, the subject land provides very marginal habitat for the species.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							insects (especially Diptera, Odonata and Coleoptera), and less often on terrestrial insects, spiders, small fish, tadpoles, frogs and skinks. In non-breeding areas, they mainly forage over coastal estuaries and freshwater wetlands, and occasionally over terrestrial vegetation. The species does not breed in Australia.	
Diomedea antipodensis	Antipodean Albatross	-	V, M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST	The Antipodean Albatross is marine, pelagic and aerial. The Antipodean Albatross nests in open patchy vegetation, such as among tussock grassland or shrubs	Low likelihood of occurrence. Suitable habitat is not available within the subject land or study area. No

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						identifies that the species or species habitat is likely to occur within the 5km locality.	on ridges, slopes and plateaus. The species does not breed in Australia.	previous records in the locality suggest the species is unlikely occur.
Diomedea antipodensis gibsoni	Gibson's Albatross	-	V, M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	Gibson's Albatross is marine, pelagic and aerial. On breeding islands, the Gibson's Albatross nests on coastal or inland ridges, slopes, plateaux and plains, often on marshy ground. In Australian territory, Gibson's Albatross has been recorded foraging between Coffs Harbour, NSW, and Wilson's Promontory, Victoria. Gibson's Albatrosses are rarely observed in the Pacific Ocean or Indian Ocean. The only Australian record of this species is from a recapture off Wollongong, NSW, in September 1997.	Low likelihood of occurrence. Suitable habitat is not available within the subject land or study area. No previous records in the locality suggest the species is unlikely occur.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							There are no breeding colonies of Gibson's Albatross in Australian territory.	
Diomedea epomophora	Southern Royal Albatross		V, M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	The species is marine, pelagic and aerial. It breeds in New Zealand; however Australia is within the foraging range of the Southern Royal Albatross.	Low likelihood of occurrence. Suitable habitat is not available within the subject land or study area. No previous records in the locality suggest the species is unlikely occur.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Diomedea exulans	Wandering Albatross	E	V, M	1	X	The NSW BioNet Atlas holds one record of the species within the locality. The only record is at the northern end of Blinky Beach. The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	The Wandering Albatross is marine, pelagic and aerial. On breeding islands, the Wandering Albatross nests on coastal or inland ridges, slopes, plateaux and plains, often on marshy ground. The Wandering Albatross eats mainly squid and fish, but also crustaceans and carrion.	Low likelihood of occurrence. Suitable habitat is not available within the subject land or study area. The species may cross aerially over the subject land on occasion but would not utilise habitat within the subject land or study area.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Fregata ariel	Lesser Frigatebird	-	M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	Lesser Frigatebirds are found throughout tropical waters in the Indian, west and central Pacific Oceans. The Lesser Frigatebird breeds on small, remote tropical and sub-tropical islands, in mangroves or bushes, and even on bare ground. Outside the breeding season it is sedentary, with immature and non-breeding individuals dispersing throughout tropical seas, especially of the Indian and Pacific Oceans. It feeds mainly on fish (especially flying-fish) and squid, but also on seabird eggs and chicks, carrion and fish scraps.	Low likelihood of occurrence. Suitable habitat is not available within the subject land or study area. No previous records in the locality suggest the species is unlikely occur.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Fregata minor	Great Frigatebird	-	M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	The Great Frigatebird breeds on small, remote tropical and sub-tropical islands, in mangroves or bushes and occasionally on bare ground. Fish, squid and chicks of other bird species (e.g. Sooty Terns) have all been identified as prey.	Low likelihood of occurrence. Suitable habitat is not available within the subject land or study area. No previous records in the locality suggest the species is unlikely occur.
Fregetta grallaria	White-bellied Storm-Petrel	V	V	11	X	The NSW BioNet Atlas holds 11 records of the species within the locality. The majority of records are located around the Lord Howe Island Airport, as well as records within the main settlement, at Transit Hill, and Intermediate Hill.	The White-bellied Storm-Petrel occurs across sub-tropical and tropical waters in the Tasman Sea, Coral Sea and, possibly, the central Pacific Ocean. In the non-breeding season, it reaches and forages over near-shore waters along the continental shelf of mainland Australia. It breeds, in Australian territory, on offshore islets and rocks in the Lord Howe	Moderate likelihood of occurrence. The species has not been recorded within the subject land or study area, however has been recorded in surrounding areas. Breeding sites for the species on Lord Howe Island are

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	Island group. It nests in crevices between large volcanic rocks, and in burrows excavated in banks. Marine, pelagic, feeds well out to sea and only at nest on offshore islands at night.	known and are not located within the study area. No suitable nesting or foraging habitat is available within the subject land, however the species may transit aerially across the subject land.
Gallinago hardwickii	Latham's Snipe	-	V, M	14	-	The NSW BioNet Atlas holds 14 records of the species within the locality, including three records within the Lord Howe Island Airport to the east of the study area. Other records are scattered through the main settlement up to Old Settlement Beach.	In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation. However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or	Moderate likelihood of occurrence. The species has not been recorded within the subject land or study area however has been recorded within surrounding areas. The subject land does not comprise preferred habitat

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						The EPBC PMST does not identify habitat within the 5km locality.	human activity. Latham's Snipe sometimes occur in habitats that have saline or brackish water, such as saltmarsh, mangrove creeks, around bays and beaches, and at tidal rivers. Latham's Snipe is an omnivorous species that feeds on seeds and other plant material and on invertebrates including insects (mainly flies and beetles), earthworms and spiders and occasionally molluscs, isopods and centipedes. The species does not breed in Australia.	for the species, however the coastal fringe may provide marginal foraging habitat for the species.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Glareola maldivarum	Oriental Pratincole	-	M	2	-	The NSW BioNet Atlas holds two records of the species within the locality, with both records to the east of the study area. The EPBC PMST does not identify habitat within the 5km locality.	The Oriental Pratincole is found in short grassland or on floodplains in close proximity to wetlands and lakes, as well as on beaches and mudflats along the coast. It prefers habitats with extensive bare areas. The species usually forages aerially in large flocks, from just above the ground to 300 m. They are seen near cyclonic storms or fires to catch prey. They are also seen foraging on the ground. The Oriental Pratincole usually roosts in bare areas that have low vegetation, such as salt marshes, airfields or clay pans. The species does not breed in Australia.	Low likelihood of occurrence. Although the species has been recorded to the east of the study area, both records are from 1987, and given Lord Howe Island is well surveyed, it is considered unlikely that the species would occur. Furthermore, the subject land does not comprise preferred habitat for the species.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Gygis alba	White Tern	V	-	259	-	The NSW BioNet Atlas holds 259 records of the species within the locality, distributed from Intermediate Hill in the south to the northern portion of the island. One previous record from 1999 occurs within the southern corner of the study area.	The species is found on Isolated tropical islands, in nearshore waters within a few kilometres of shore, and often in lagoons or over reefs; in sheltered wooded valleys during breeding season. It is occasionally recorded in pelagic zone, especially off mainland Australia. Its breeding season varies locally. It nests on coral islands, usually with vegetation, nesting in trees and bushes, on rocky slopes and cliffs, and also on artificial substrates. It lays a single egg on a bare branch, usually within a slight depression at a fork or on the midrib of a palm frond or banana leaf. Most breeding sites on Lord Howe Island are close to the	Known to occur. The species was recorded within the subject land during field surveys in 2024 and 2025. Suitable nesting and breeding habitat is available, predominantly within the exotic Norfolk Island Pine trees that have been planted within the subject land.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							lagoon in the settlement area. Preferred species vary but on Lord Howe Island it usually nests in Norfolk Island Pines (*Araucaria heterophylla*) or Sallywood (*Lagunaria patersonia*). It is resident year-round on some islands but is a seasonal visitor on others where its non-breeding movements are not known. This species feeds mainly upon small fish but will also take squid and crustaceans.	

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Haematopus fuliginosus	Sooty Oystercatcher	V	-	1	-	The NSW BioNet Atlas holds one records of the species from 1987 in the northern portion of the island.	The species favours rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries. It forages on exposed rock or coral at low tide for foods such as limpets and mussels. The Sooty Oystercatcher breeds in spring and summer, almost exclusively on offshore islands, and occasionally on isolated promontories. The nest is a shallow scrape on the ground, or small mounds of pebbles, shells or seaweed when nesting among rocks.	Low likelihood of occurrence. Lord Howe Island is well surveyed and only one previous record occur within the locality. The previous record is not located in proximity to the subject land. Some potential habitat Is present along the coastal fringe of the subject land.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Haematopus longirostris	Pied Oystercatcher	E	-	1	-	The NSW BioNet Atlas holds one records of the species from 1998 in the northern portion of the island.	The species favours intertidal flats of inlets and bays, open beaches and sandbanks. Forages on exposed sand, mud and rock at low tide, for molluscs, worms, crabs and small fish. The chisel-like bill is used to pry open or break into shells of oysters and other shellfish. The species nest mostly on coastal or estuarine beaches although occasionally they use saltmarsh or grassy areas. Nests are shallow scrapes in sand above the high tide mark, often amongst seaweed, shells and small stones.	Low likelihood of occurrence. Lord Howe Island is well surveyed and only one previous record occur within the locality. The previous record is not located in proximity to the subject land. Some potential habitat Is present along the coastal fringe of the subject land.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Hirundapus caudacutus	White-throated Needletail	V	V, M	2	-	The NSW BioNet Atlas holds two records of the species from 2002 in the northern portion of the island. The EPBC PMST does not identify habitat within the 5km locality.	In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. The species has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows. It has been suggested that they also sometimes roost aerially. The species breeds in wooded lowlands and sparsely vegetated hills, as well as mountains covered with coniferous forests.	Low likelihood of occurrence. Only two previous records have been identified within the locality, both in the northern portion of the locality. The species is almost exclusively aerial and the subject land does not provide suitable habitat. If the species was to occur, it would only be to pass aerially over the subject land.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Hydroprogne caspia	Caspian Tern	-	M	5	-	The NSW BioNet Atlas holds five records of the species from to the east of the study area, including three records within the Lord Howe Island Airport. The EPBC PMST does not identify habitat within the 5km locality.	The species is mostly found in sheltered coastal embayments and those with sandy or muddy margins are preferred. The species usually forages in open wetlands, including lakes and rivers. Generally roosting occurs on bare exposed sand or shell spits, banks or shores of coasts, lakes, estuaries, coastal lagoons and inlets. The species breeds on variable types of sites including low islands, cays, spits, banks, ridges, beaches of sand or shell, terrestrial wetlands and stony or rocky islets or banks.	Moderate likelihood of occurrence. The species has not been recorded within the subject land or study area, however has been recorded in surrounding areas to the east. Despite few records, the subject land provides potential habitat along the coastal fringe.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Hypotaenidia sylvestris	Lord Howe Woodhen	E	E	5846	X	The NSW BioNet Atlas holds 5,846 records of the species within the locality, including numerous records within the study area. The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	Lord Howe Woodhens occupy the subtropical forests of the oceanic Lord Howe Island. Woodhens occur in closed forest on boulder covered slopes, steep scree, valleys, plateaus and near cliffs. This species is rarely found in rainforest, the most widespread habitat on the island, but prefers palm dominated lowland closed forest on igneous soils, possibly because this vegetation type has more available food. They also occur in forest bordering pasture and gardens, paddocks and small reedy swamps. At lower altitudes, woodhens are largely confined to megaphyllous broad sclerophyll forest, especially	Known to occur. The species was recorded throughout the subject land during 2024 and 2025 field surveys.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							stands of Kentia Palm (Howea forsteriana) that grow on igneous soils, but also Banyan (Ficus macrophylla subsp. column aris), Yellow Tulipwood (Drypetes australasica) and Three-veined Laurel (Cryptocarya triplinervis). Lord Howe Woodhens have been known to nest on the ground in thick vegetation, under tree roots and fallen logs, and even in a 10–65 cm deep petrel (Pterodroma) burrow.	

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Limosa lapponica baueri	Bar-tailed Godwit	E	E, M	321	X	The NSW BioNet Atlas holds 321 records of the species within the locality, including one record in the southern corner of the study area. Numerous other records are present within the Lord Howe Island Airport. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	The Bar-tailed Godwit is mainly a coastal species, and inhabits intertidal sand flats, mudflats, estuaries, harbours and coastal lagoons. The species has been recorded in coastal sewage farms and salt lakes and brackish wetlands, sandy ocean beaches, rock platforms, and around beds of seagrass. Preferred feeding habitats include shallow water or the edge of water in tidal estuaries, harbours, or soft mud with seagrass beds. Main habitat requirements for roosting include sandy beaches and near-coastal salt marshes. The Bar-tailed Godwit does not breed in Australia.	High likelihood of occurrence. The species has been recorded within the study area, although not directly within the subject land. Records of the species were of individuals foraging along the foreshore of the South Zone. The species has not been recorded within the North Zone, however has the potential to occur along sections of the sandy foreshore. The subject land and wider study area do not provide

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
								suitable breeding habitat.
Limosa limosa	Black-tailed Godwit	V	E, M	2	-	The NSW BioNet Atlas holds two records of the species within the locality, with one record within the Lord Howe Island Airport and one within a wetland east of the airport behind the dunes of Blinky Beach. The latest record is from	The species is commonly found in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit. The species forages on wide intertidal mudflats or sandflats, in soft mud or shallow water and occasionally in shallow estuaries. The claypan may	Low likelihood of occurrence. No previous records within the subject land or study area and no recent records within the locality. Some marginal habitat is available along the coastal fringe for foraging however

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						1995. The EPBC PMST does not identify habitat within the 5km locality.	be an important roost site for this species at least during the non-breeding season. The Black-tailed Godwit does not breed in Australia.	no suitable roosting or breeding habitat is present.
Macronectes giganteus	Southern Giant-Petrel	-	E, M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat may occur within the 5km locality.	Southern Giant Petrel forage at sea, and also scavenge on land. The species does not breed in Australia. Nesting sites for the species in Australia include Southern Giant Petrel nests on Heard Island, McDonald Islands and Macquarie Island. During breeding periods Southern Giant Petrel prey mainly on cephalopods and fish at sea, and also prey on penguin chicks on land and scavenge seal or penguin carrion.	Low likelihood of occurrence. Suitable habitat is not available within the subject land or study area. No previous records in the locality suggest the species is unlikely occur.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Macronectes halli	Northern Giant Petrel	-	V, M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat may occur within the 5km locality.	The species breeds on Macquarie Island in Australia. The species are diurnal feeders at sea that also scavenge on land during the day and at night.	Low likelihood of occurrence. Suitable habitat is not available within the subject land or study area. No previous records in the locality suggest the species is unlikely occur.
Motacilla flava	Yellow Wagtail	-	M	1	-	The NSW BioNet Atlas holds one record of the species within the locality, within vegetation to the north-west of Transit Hill. The EPBC PMST does not identify habitat within the 5km locality.	Habitat requirements for the Yellow Wagtail are highly variable, but typically include open grassy flats near water. Habitats include open areas with low vegetation such as grasslands, airstrips, pastures, sports fields; damp open areas such as muddy or grassy edges of wetlands, rivers, irrigated farmland, dams, waterholes; sewage	Low likelihood of occurrence. Lord Howe Island is well surveyed and only one previous record occurs within the locality. Potential roosting habitat in the form of dense vegetation is present however the subject land is not considered to

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							farms, sometimes utilise tidal mudflats and edges of mangroves. Little information on the foraging requirements of this species in Australia is currently known. This species roosts in mangroves and other dense vegetation. The species does not breed in Australia.	provide preferred roosting habitat for the species.
Numenius madagascariensis	Eastern Curlew	-	CE, M	5	X	The NSW BioNet Atlas holds five records of the species within the locality, including records within the Lord Howe Island Airport. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	During the non-breeding season in Australia, the Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. The species mainly forages during the non-breeding season on soft sheltered	Moderate likelihood of occurrence. Potential roosting and foraging habitat Is available within the subject land, predominantly along the coastal fringe within the South Zone. Only a low number of

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							intertidal sandflats or mudflats, open and without vegetation or covered with seagrass, often near mangroves, on saltflats and in saltmarsh, rockpools and among rubble on coral reefs, and on ocean beaches near the tideline. The species roosts during high tide periods on sandy spits, sandbars and islets, especially on beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. The species does not breed in Australia.	records from the locality with the most recent records from 2009. Species occurrence is likely to be limited to irregular visitors.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Numenius minutus	Little Curlew	-	M	9	-	The NSW BioNet Atlas holds nine records of the species within the locality, include records immediately east of the study area. The EPBC PMST does not identify habitat within the 5km locality.	The Little Curlew is most often found feeding in short, dry grassland and sedgeland, including dry floodplains and black soil plains, which have scattered, shallow freshwater pools or areas seasonally inundated. Open woodlands with a grassy or burnt understorey, dry saltmarshes, coastal swamps, mudflats or sandflats of estuaries or beaches on sheltered coasts, mown lawns, gardens, recreational areas, ovals, racecourses and verges of roads and airstrips are also used. When resting during the heat of day, the Little Curlew congregates around pools, river beds and water-filled tidal channels, and shallow water at edges	Moderate likelihood of occurrence. Potential roosting and foraging habitat Is available within the subject land, predominantly along the coastal fringe. Only a low number of records from the locality with the most recent records from 2003.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							of billabongs. The species prefers pools with bare dry mud (including mudbanks in shallow water) and they do not use pools if they are totally dry, flooded or heavily vegetated. The Little Curlew is gregarious, and can be seen in dense flocks of several hundred, sometimes thousands, on coastal and inland grasslands and black soil plains of northern Australia, most often near freshwater swamps and pools or flooded ground. The species does not breed in Australia.	

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Numenius phaeopus	Whimbrel	-	M	265	-	The NSW BioNet Atlas holds 265 records of the species within the locality, including numerous other records within the Lord Howe Island Airport. One record is present within the southern corner of the study area. The EPBC PMST does not identify habitat within the 5km locality.	The species is often found on the intertidal mudflats of sheltered coasts. The species generally forages on intertidal mudflats, along the muddy banks of estuaries and in coastal lagoons, either in open unvegetated areas or among mangroves. The species often roosts in the branches of mangroves around mudflats and in estuaries and occasionally in tall coastal trees. The Whimbrel does not breed in Australia.	High likelihood of occurrence. The species has been recorded within the study area although not directly within the subject land. Records of the species were observed from a point within the subject land of individuals along the foreshore adjacent to Cobby's Creek in the South Zone. Suitable foraging habitat is available within the North and South Zones, particularly during low tides, however the subject land and

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
								wider study area do not comprise suitable roosting habitat. No breeding habitat it present.
Onychoprion fuscata	Sooty Tern	V	-	596	-	The NSW BioNet Atlas holds 596 records of the species within the locality, including numerous other records within the Lord Howe Island Airport. One record is present within the southern corner of the study area. The EPBC PMST does not identify habitat within the 5km locality.	The Sooty Tern breeds on flat, open, sparsely or heavily vegetated, oceanic or barrier islands of sand, coral or rock in productive tropical and subtropical offshore waters rich in plankton, fish and squid. The species breeds in large colonies in sand or coral scrapes on offshore islands and cays including Lord Howe and Norfolk Islands.	Known to occur. The species has been recorded flying across the subject land. The subject land includes a very small area of the lagoon which may be used for foraging. However, the species is not known to roost within the subject land. The species

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
								roosts in large colonies, of which were not identified within the subject land or study area. Roosting sites on the island are well known and include Blinky Beach and Ned's Beach.
Pachycephala pectoralis contempta	Golden Whistler (Lord Howe Is. subsp.)	V	-	34	-	The NSW BioNet Atlas holds 34 records of the species within the locality, with records predominantly around the main settlement area.	The species is widely distributed in the forests of the main island. It is often seen feeding around houses throughout the settlement area. These birds hop from branch to branch looking for insects, spiders and insect larvae. They also forage in the leaf litter. The species construct an open cup-shaped nest made up of palm fibre, vines and leaves and lined with grass.	Known to occur. Suitable foraging and nesting habitat is available within the subject land and wider study area and the species was recorded within the subject land during 2024 and 2025 field surveys.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Phaethon lepturus	Fairy Prion (southern)	-	M	5	-	The NSW BioNet Atlas holds five records of the species within the locality. Two records are located between the study area and Blinky beach to the east of the airport, with both records from 1989 and 1997 respectively. The most recent record on the island is from 2003. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	The White-tailed Tropicbird (Indian Ocean) breeds at three locations within Australian territory: in the Cocos-Keeling Islands; at Ashmore Reef, Western Australia; and at Rowley Shoals, Western Australia. The White-tailed Tropicbird occupies marine habitats in tropical waters with sea-surface temperatures of more than 22°C. The tropicbird breeds on islands and atolls, where it nests in a variety of habitats including on bare sandy ground, in closed-canopy rainforest, on rocky cliffs and in quarries. The only variation in habitat used by the White-tailed Tropicbird throughout its range is its occurrence in	Low likelihood of occurrence. The subject land does not comprise suitable habitat for the species. Although the species may, on occasion, transit aerially across the subject land, it would not utilise the habitat available within the subject land.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							subtropical waters off New South Wales or, on rare occasions, Victoria. The White-tailed Tropicbird feeds on fish (mostly flying-fish) and cephalopods.	
Phaethon rubricauda	Red-tailed Tropicbird	V	M	284	-	The NSW BioNet Atlas holds 284 records of the species within the locality, with records disbursed across the whole island. The EPBC PMST identifies that the species or species habitat is known to	At sea, the species is solitary, flying mostly well above the waves with regular, mechanical wing-beats alternating with horizontal glides. The species breeds in tropical and subtropical zones on volcanic and other islands, stacks, atolls, cays away from mainland areas. Nests are located in rugged terrain, on coastal cliffs and	Low likelihood of occurrence. The subject land and study area do not comprise suitable habitat for the species. The species is likely to transit aerially across the subject land, particularly the North Zone given

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						occur within the 5km locality.	slopes but also on cays, at the base of trees with dense leaf canopy that reaches the ground, and coral atolls. Most food is captured by deep plunging vertically into the water. Their diet mainly consists of fish and cephalopods.	its occurrence along the cliffs on the northern end of the island, however it would not utilise the habitat available within the subject land. As such the species is not considered likely to occur within the subject land.
Pluvialis fulva	Pacific Golden Plover	-	M	532	-	The NSW BioNet Atlas holds 532 records of the species within the locality, including a large number of records at the Lord Howe Island airport. Furthermore, there is one record of the species in the southern corner of	In Australia this species usually inhabits coastal habitats, though it occasionally occurs around inland wetlands. This species usually forages on sandy or muddy shores (including mudflats and sandflats) or margins of sheltered areas such as estuaries and lagoons,	High likelihood of occurrence. The species has been recorded within the study area although not directly within the subject land. Records of the species were observed from a point within the

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						the study area. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	though it also feeds on rocky shores, islands or reefs. The species usually roost near foraging areas, on sandy beaches and spits or rocky points, islets or exposed reefs, occasionally among or beneath vegetation including mangroves or low saltmarsh, or among beachcast seaweed. The species does not breed in Australia.	subject land of individuals along the sandy beach (in the South Zone) and on rocky outcrops (in the North Zone). Suitable foraging habitat is available within the North and South Zones, particularly during low tides, however the subject land and wider study area do not comprise suitable roosting habitat. No breeding habitat it present.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Pluvialis squatarola	Grey Plover	-	M	1	-	The NSW BioNet Atlas holds one records of the species within the locality, located off Neds Beach. The EPBC PMST does not identify habitat within the 5km locality.	The species occurs almost entirely in coastal areas, where they usually inhabit sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally on rocky coasts with wave-cut platforms or reef-flats, or on reefs within muddy lagoons. The species usually forages on large areas of exposed mudflats and beaches of sheltered coastal shores such as inlets, estuaries and lagoons. The species usually roosts in sandy areas, such as on unvegetated sandbanks or sand-spits on sheltered beaches or other sheltered environments such as estuaries or lagoons. This species does not breed in Australia.	Low likelihood of occurrence. Despite seemingly suitable habitat along the foreshore within the subject land, the species has not been recorded within the subject land or study area and appear to be a very rare visitor to Lord Howe Island. As such it is considered to have a very low likelihood of occurrence.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Anous albivitta	Grey Ternlet	V	-	9	-	The NSW BioNet Atlas holds nine records of the species within the locality, in the northern portion of the island around North Beach and Old Gulch and in the south-east at Mutton bird Point. The EPBC PMST does not identify habitat within the 5km locality.	Grey Noddy breeds on Lord Howe and Norfolk Islands and on Kermadec Island, New Zealand. The species is distributed across the Pacific Ocean and breeds on isolated tropical and subtropical islands, islets or rock stacks. Breeding can be continual in places and occurs in loose colonies. This species takes very small fish (average length 17 mm), squid, crustaceans and pelagic sea striders with proportions varying seasonally and geographically.	Low likelihood of occurrence. The subject land does not comprise suitable roost or breeding habitat for the species. A small area of foraging habitat would be available along the front of the lagoon. The species would most likely only transit aerially across the subject land.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Pterodroma heraldica	Herald Petrel	-	CE	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat may occur within the 5km locality.	The Herald Petrel is a marine, pelagic species of tropical and subtropical waters. The species nests on tropical and subtropical islands, atolls, cays and rocky islets. In the Australasian region, breeding is only known from Raine Island, Queensland, where the birds nest on the ground on a low sand ridge, under a mat of dense shrubs (*Achyranthes aspera, Abutilon indicum, Amaranthus leptostachys, Sesbania cannabina*), creepers (*Tribulus cistoides*) and grass (*Lepturus repens*).	Low likelihood of occurrence. Suitable habitat is not available within the subject land. No previous records in the locality suggest the species is unlikely occur.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Pterodroma leucoptera leucoptera	Gould's Petrel	V	E	1	X	The NSW BioNet Atlas holds one record of the species within the locality, located off Neds Beach. The EPBC PMST identifies that the species or species habitat may occur within the 5km locality.	The species 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. They nest predominantly in natural rock crevices among the rock scree and also in hollow fallen palm trunks, under mats of fallen palm fronds and in cavities among the buttresses of fig trees. They breed colonially and the nests are clumped and often less than 1 m apart.	Low likelihood of occurrence. The subject land does not provide suitable habitat for the species. Rare occurrences of the species may be recorded aerially above the subject land however this would only be records of the species in transit.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Pterodroma neglecta neglecta	Kermadec Petrel (west Pacific subspecies)	V	V	8	X	The NSW BioNet Atlas holds eight records of the species within the locality, several of which occur within the main settlement area. These records are considered likely to be of the species transiting aerially across the island given the species known breeding requirements. The EPBC PMST identifies that the species or species habitat may occur within the 5km locality.	The Kermadec Petrel (western) is a pelagic seabird that occurs in tropical, subtropical and temperate waters of the Pacific Ocean. Breeding habitat in Australia includes Balls Pyramid, a tall rock stack where it occurs above an altitude of 400 metres, and nests on sheltered tussock ledges on steep cliff faces, and may be seen flying at high altitudes around the cliffs; and on Phillip Island, where pairs nest beneath Olive (Olea europaea) shrubs in elevated regions around the centre of the island. The species formerly nested on almost inaccessible ledges at Mount Gower and Mount Lidgbird on Lord Howe	Low likelihood of occurrence. The subject land does not provide suitable habitat for the species. Rare occurrences of the species may be recorded aerially above the subject land however this would only be records of the species in transit.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							Island and, although this breeding colony is now extinct, it is thought that some birds continue to fly about the cliffs of Mount Gower.	
Pterodroma nigripennis	Black-winged Petrel	V	-	357	-	The NSW BioNet Atlas holds 357 records of the species within the locality, including numerous other records within the Lord Howe Island Airport. One record is present within the southern corner of the study area.	It breeds in colonies, usually making burrows on high ground inland amongst scrub or tussock grass. Outside the breeding season it migrates to the north and east Pacific, being common in the north-west Pacific in July–November. Little is known about its diet, but it is known to include	Known to occur. Breeding sites for the species on Lord Howe Island are known and are not located within the subject land. No suitable roosting habitat is available within the subject land or study area.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							cephalopods and prawns which it catches mainly by surface-seizing and dipping, but also pattering. It has often been recorded feeding in association with other shearwaters and petrels.	A very small area of the lagoon offers potential foraging habitat for the species, although records within the subject land were of the species transiting aerially across the subject land.
Pterodroma solandri	Providence Petrel	V	-	226	-	The NSW BioNet Atlas holds 226 records of the species within the locality, including several other records within the Lord Howe Island Airport. One record is present within the northern boundary of the study area.	Breeding is restricted to Lord Howe Island and Phillip Island. It nests in burrows or under rock cavities and occasionally between tree buttresses from sea level to 900 m. On Lord Howe, it breeds in forest. The adults feed predominantly on squid and fish with crustaceans less important.	Low likelihood of occurrence. Breeding sites for the species on Lord Howe Island are known and are not located within the subject land. No suitable foraging, roosting or breeding habitat is available within the subject land or

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
								study area. The species is likely to transit aerially across the subject land on occasion when moving between foraging and roosting sites, however it would not utilise the habitat available within the subject land. As such is not considered likely to occur within the subject land.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Puffinus assimilis	Little Shearwater	V	-	14	-	The NSW BioNet Atlas holds 14 records of the species within the locality, all of which are within the central portion of the island.	The Little Shearwater is a marine, pelagic species, occurring in subantarctic, subtropical and occasionally tropical waters. They breed on rocky or forested islands, or on those with tussock grasslands. In the Lord Howe and Norfolk groups, they nest amongst short vegetation, below bushes or forest, in cliff tops or among rocks. In the Lord Howe and Norfolk Island groups, they nest in burrows dug into the sand, in holes beneath overhanging rocks or in crevices between rocks. On Lord Howe Island itself they are nesting under bushes of Melaleuca howeana and amongst the vine *Parsonsia howeana*, often sharing	Low likelihood of occurrence. No previous records within the subject land. Suitable foraging and breeding habitat is available, however field surveys did not detect the species. Although the Wedge-tailed Shearwater was observed within the subject land, there were no records of the Little Shearwater intermixed. The location of nesting sites for Shearwater species is relatively well known and the species is not

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							burrows with Black-winged Petrels.	expected to utilise the subject land.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Rostratula australis	Australian Painted Snipe	E	E	1	-	The NSW BioNet Atlas holds one record of the species within the locality, The record is from 1990 and is located within a small dam/wetland behind Blinky Beach. The EPBC PMST does not identify habitat within the 5km locality.	It is most common in eastern Australia, where it has been recorded at scattered locations throughout much of Queensland, NSW, Victoria and south-eastern South Australia. It has also been recorded on single occasions in south-eastern Tasmania and at Lord Howe Island. The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. Australian Painted Snipe breeding habitat requirements may be quite specific: shallow wetlands with areas of bare wet mud and both upper	Low likelihood of occurrence. The subject land does not comprise freshwater wetland habitat required by the species. The single record from the locality in 1990 suggest the species has a very low likelihood of occurrence within the subject land.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							and canopy cover nearby. Nest records are all, or nearly all, from or near small islands in freshwater wetlands.	
Sterna hirundo	Common Tern	-	M	7	-	The NSW BioNet Atlas holds seven records of the species within the locality, All records are from a single location at North Beach. One record is from 2013, while the other six records are from consecutive days on 2014.	The species is marine, pelagic and coastal. The species forages in marine environments, often close to the shore, including sheltered embayments and in the surf-zone, but also well out to sea. The species roosts on unvegetated, intertidal sandy ocean beaches, sandy islands, shores of estuaries or	Low likelihood of occurrence. The species has only been recorded from North Beach with the latest records from 2014. Some suitable roosting habitat is available along the foreshore, however previous records

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						The EPBC PMST does not identify habitat within the 5km locality.	lagoons, and sandbars, as well as on rocky shores, rock platforms or rocks protruding above the surface of the water. The species does not breed in Australia.	suggest the species would rarely utilise the habitat within the subject land.
Sternula albifrons	Little Tern	E	M	2	-	The NSW BioNet Atlas holds two records of the species within the locality, One record is from North Beach in 1986 and the other is from a site behind Blinky Beach from 1999. The EPBC PMST does not identify habitat within the 5km locality.	The species inhabits sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand-spits, and also on exposed ocean beaches. The species forages in shallow waters of estuaries, coastal lagoons and lakes, frequently over channels next to spits and banks or entrances, and often close	Low likelihood of occurrence. The subject land provides some suitable foraging and roosting habitat along the foreshore, however the species has not been recorded within the subject land or study area and there have been no recent records in the locality.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							to breeding colonies. The species roosts on sand-spits, banks and bars within sheltered estuarine or coastal environments, or on the sandy shores of lakes and ocean beaches. The species nest on sand-spits, banks, ridges or islets in sheltered coastal environments, such as coastal lakes, estuaries and inlets, and also on wide and flat or gently sloping sandy ocean beaches, and also, occasionally, in sand-dunes.	

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Strepera graculina crissalis	Pied Currawong (Lord Howe Is. subsp.)	V	V	56	X	The NSW BioNet Atlas holds 56 records of the species within the locality, with records scattered across the entire island. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	The Pied Currawong (Lord Howe Island) occurs in lowland, hill and mountain regions, including the summit of Mount Gower (866 m above sea level). It mainly inhabits tall rainforests and palm forests, especially beside creeks or in gullies, but it also occurs in settled areas, and forages amongst colonies of seabirds on offshore islets. The Pied Currawong occurs in areas inhabited by the Lord Howe Woodhen (*Gallirallus sylvestris*), which is listed under the EPBC Act 1999. The chicks of the Lord Howe Woodhen provide a source of food for the Pied Currawong. The Pied Currawong is omnivorous.	Known to occur. The species was recorded within the subject land and study area during the 2024 and 2025 field surveys.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Sula dactylatra	Masked Booby	V	M	639	X	The NSW BioNet Atlas holds 639 records of the species within the locality, including records within the study area and the Lord Howe Island Airport. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	The Masked Booby is a pelagic marine bird using tropical and subtropical waters. The Masked Booby breeds on tropical oceanic islands, atolls and cays, usually far from mainland areas. Proximity to clear, deep water is important in choice of nesting grounds. Areas of level open ground are preferred for nest sites and colonies extend from central areas to water's edge, just above high-water marks, on bare surfaces of sand, guano, coral fragments or lava, or among low cover of grasses, herbs or shrubs. Where vegetation encroaches, colonies may become restricted to smaller and smaller areas of bare ground. On Lord Howe	High likelihood of occurrence. Breeding sites for the species on Lord Howe Island are known and are not located within the subject land or study area. No suitable roosting or foraging habitat is available within the subject land, however the species was only recorded in transit aerially across the subject land and study area.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							Island, the Masked Booby is said to breed on high open areas where they can take off directly into the wind. The Masked Booby roosts on the ground beside their nests when breeding, although sometimes breeding birds roost on beaches near colonies.	
Thalassarche bulleri	Buller's Albatross	-	V, M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat may occur	Buller's Albatross are marine and pelagic, inhabiting subtropical and subantarctic waters of the southern Pacific Ocean. Buller's Albatross feeds mostly on squid, supplemented by fish, krill and tunicates. The	Low likelihood of occurrence. Suitable habitat is not available within the subject land. No previous records in the locality suggest

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						within the 5km locality.	species does not breed in Australia.	the species is unlikely occur.
Thalassarche bulleri platei	Northern Buller's Albatross	-	V, M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat may occur within the 5km locality.	The species is a marine, pelagic species. In Australia, the species occurs over inshore, offshore and pelagic waters and off the coast of south-east Tasmania. The species does not breed in Australia.	Low likelihood of occurrence. Suitable habitat is not available within the subject land. No previous records in the locality suggest the species is unlikely occur.
Thalassarche carteri	Indian Yellow-nosed Albatross	-	V, M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat is likely to	The Indian Yellow-nosed Albatross is a marine bird, located in subtropical and warmer subantarctic waters. In the Australasian region, the species occupies inshore and offshore waters, particularly where there are calm seas and light winds.	Low likelihood of occurrence. Suitable habitat is not available within the subject land. No previous records in the locality suggest

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
						occur within the 5km locality.	The Indian Yellow-nosed Albatross takes cephalopods (squid) and fish. The species does not breed in Australia.	the species is unlikely occur.
Thalassarche impavida	Campbell Albatross	-	V, M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat may occur within the 5km locality.	The Campbell Albatross is a marine sea bird inhabiting sub-Antarctic and subtropical waters from pelagic to shelf-break water habitats. n breeding and non-breeding seasons, the Campbell Albatross are specialised shelf feeders, concentrating around breeding islands or over adjacent submarine banks. The Campbell Albatross breed on Campbell Island. They make their nests on tussock-covered ledges and terraces of cliffs, slopes and hills, overlooking the sea or	Low likelihood of occurrence. Suitable habitat is not available within the subject land. No previous records in the locality suggest the species is unlikely occur.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							valleys, and on the summits of rocky islets. The Campbell Albatross is a non-breeding visitor to Australian waters.	
Thalassarche melanophris	Black-browed Albatross	-	V, M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	The Black-browed Albatross breeds on subantarctic and peri-antarctic islands in colonies located on terraces of coastal cliffs, slopes of nearby hills, summits of rocky islets or on flat or gently-sloping ground. The terrain in such areas is rocky, but usually supports a moderately-dense cover of tussock grasses. The Black-browed Albatross is a	Low likelihood of occurrence. Suitable habitat is not available within the subject land. No previous records in the locality suggest the species is unlikely occur.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							marine species that inhabits Antarctic, subantarctic and temperate waters and occasionally enters the tropics. The Black-browed Albatross breeds within Australian jurisdiction on Heard Island, McDonald Islands, Macquarie Island and Bishop and Clerk Islets. The diet of the Black-browed Albatross primarily consists of a combination of fish, molluscs (mostly cephalopods) and crustaceans (mostly krill).	

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Thalassarche salvini	Salvin's Albatross	-	V, M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	Salvin's Albatross is a non-breeding visitor to Australian waters. Salvin's Albatross is a marine species occurring in subantarctic and subtropical waters, reaching the tropics in the cool Humboldt Current, off South America. During the non-breeding season, the species occurs over continental shelves around continents. It occurs both inshore and offshore and enters harbours and bays. It is scarce in pelagic waters. Salvin's Albatross probably takes inshore cephalopods (squid) and fish.	Low likelihood of occurrence. Suitable habitat is not available within the subject land. No previous records in the locality suggest the species is unlikely occur.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Thalassarche steadi	White-capped Albatross	-	V, M	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat may occur within the 5km locality.	The White-capped Albatross is common off the coast of south-east Australia throughout the year. The species does not breed in Australia. It is a marine species and occurs in subantarctic and subtropical waters. It reaches tropical areas associated with the cool Humboldt Current off South America. Birds nest on slopes vegetated with tussock and succulents on Auckland Island. The White-capped Albatross probably has a diet of inshore cephalopods (squid) and fish.	Low likelihood of occurrence. Suitable habitat is not available within the subject land. No previous records in the locality suggest the species is unlikely occur.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Tringa brevipes	Grey-tailed Tattler	-	M	40	-	The NSW BioNet Atlas holds 40 records of the species within the locality, including records within the Lord Howe Island airport. The EPBC PMST does not identify habitat within the 5km locality.	The species is often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. The species usually forages in shallow water, on hard intertidal substrates, such as reefs and rock platforms, in rock pools and among rocks and coral rubble, over which water may surge. The species usually roosts in the branches of mangroves or, rarely, in dense stands of other shrubs, or on snags or driftwood. This species does not breed in Australia.	Moderate likelihood of occurrence. The study area provides some roosting habitat, albeit marginal along Cobbys Creek in the South Zone however no roosting habitat is available within the subject land. The species may utilise the foreshore of the subject land for foraging. Although the species has not been recorded in the subject land or study area, it has been recorded in adjacent areas around the airport.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Tringa glareola	Wood Sandpiper	-	M	4	-	The NSW BioNet Atlas holds four records of the species within the locality, with all records from consecutive days in 2018. Records were all located within the small dam/wetland behind Blinks beach. The EPBC PMST does not identify habitat within the 5km locality.	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially Melaleuca and River Red Gums *Eucalyptus camaldulensis* and often with fallen timber. They also frequent inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops. They are also found at some small wetlands only when they are drying.	Low likelihood of occurrence. The subject land does not contain freshwater wetland, inundated grasslands or wooded floodplains. Furthermore, the species does not breed in Australia.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							Typically they do not use coastal flats, but are occasionally recorded in stony wetlands. The Wood Sandpiper forages on moist or dry mud at the edges of wetlands, either along shores, among open scattered aquatic vegetation, or in clear shallow water. The species does not breed in Australia.	

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Tringa incana	Wandering Tattler	-	M	32	-	The NSW BioNet Atlas holds 32 records of the species within the locality. Most records are located in the north around North Beach, however a few records occur around the Lord Howe Island airport. The EPBC PMST does not identify habitat within the 5km locality.	The Wandering Tattler is generally found on rocky coasts with reefs and platforms, points, spits, piers, offshore islands and shingle beaches or beds. It is occasionally seen on coral reefs or beaches, and tends to avoid mudflats. Foraging habitat is among rocks or shingle, or in shallow pools at edges of reefs or beaches, mainly along the tideline. Wandering Tattlers have been recorded roosting or perching on top of boulders surrounded by or close to water. Wandering Tattlers feed on Polychaete worms, molluscs and crustaceans mainly on rocky coasts, reefs, and, less often, on beaches and mudflats. The	High likelihood of occurrence. The study area provides potential foraging and roosting habitat along the foreshore and exposed rock shelf. The species was recorded on one occasion within the North Zone roosting on the exposed rock shelf. The record was made from a site within the subject land however the species was not directly located within the subject land. Nevertheless, potential habitat is available within the

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							species does not breed in Australia.	North Zone. No suitable roosting habitat is available within the South Zone. Furthermore, the species does not breed in Australia.
Tringa nebularia	Common Greenshank	-	E, M	14	X	The NSW BioNet Atlas holds 14 records of the species within the locality, including one record within the study area from 1999. The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	Found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. The species is known to forage at edges of wetlands, in soft mud on mudflats, in channels, or in shallows around the edges of water often among	Moderate likelihood of occurrence. The species has been recorded within the southern corner of the study area as well as around Blinky Beach to the east. Although the species has been recorded within the study area, this

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							pneumatophores of mangroves or other sparse, emergent or fringing vegetation, such as sedges or saltmarsh. Roosts and loafs around wetlands, in shallow pools and puddles, or slightly elevated on rocks, sandbanks or small muddy islets. The species does not breed in Australia.	record was from 1999, and very few records of the species have been recorded despite the island being well surveyed. The species has not been recorded within the subject land.
Tringa stagnatilis	Marsh Sandpiper	-	M	7	-	The NSW BioNet Atlas holds seven records of the species within the locality, including one record at Neds Beach and six records to the east of the study area. The EPBC PMST does not identify habitat within the 5km locality.	The species lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. The species usually forages in shallow water at the edge of wetlands. The species has	Moderate likelihood of occurrence. The species has not been recorded within the subject land or study area, however has been recorded in surrounding areas to the east. Despite the nearby records, the subject land

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							been recorded roosting or loafing on tidal mudflats, near low saltmarsh, and around inland swamps. The species does not breed in Australia.	provides marginal habitat along the coastal fringe.
Tyto novaehollandiae castanops	Masked Owl (Tasmanian)	V	-	107	-	The NSW BioNet Atlas holds 107 records of the species within the locality, distributed across the entire island.	The species is considered a pest on Lord Howe Island foraging on several threatened and/or migratory bird and reptile species. The species inhabits the whole of the main island within forests inside and outside of the settlement.	High likelihood of occurrence. The species is considered a pest on Lord Howe Island however is likely to utilise the subject land for foraging and roosting. The study area does not contain trees with suitable hollows for breeding.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Xenus cinereus	Terek Sandpiper	V	M	3	-	The NSW BioNet Atlas holds three records of the species within the locality, including one record near Blinky Beach and two at Old Settlement Beach. The EPBC PMST does not identify habitat within the 5km locality.	The species occurs on mudflats or in sheltered estuaries, embayments, harbours or lagoons. The species has also been recorded on islets, mudbanks, sandbanks and spits, and near mangroves and occasionally in samphire. This species mostly forages in the open, on soft wet intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons. The species prefers to roost in or among mangroves. This species does not breed in Australia.	Moderate likelihood of occurrence. The species has not been recorded within the subject land or study area, however has been recorded on one occasion near Blinky Beach. Despite the low number of records in the locality, potential habitat is present within the subject land along the coastal fringe.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Zosterops lateralis tephropleurus	Silvereye (Lord Howe Is. subsp.)	V	-	19	-	The NSW BioNet Atlas holds 19 records of the species within the locality, the majority located within the main settlement.	Widely distributed in the forests of the main island. It is often seen feeding around island homes throughout the settlement area. They glean leaves and flowers for insects, visit flowers for nectar, and eat small seeds and fruits, including the exotic Cherry Guava.	Known to occur. The species was recorded within the subject land during the 2024 and 2025 field surveys.
Reptiles								
Christinus guentheri	Lord Howe Island Gecko	V	V	133	X	The NSW BioNet Atlas holds 133 records of the species within the locality, including three records within the study area. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	The species occurs in a wide range of forest types including lowland rainforest, montane rainforest and Poa poiformis islets. The species prefers rocky areas that offer protection, with crevices, rock slabs or boulders embedded in the soil. On the Lord Howe Island mainland they appear restricted to a single, rare habitat type behind	High likelihood of occurrence. The species was recorded within the study area during field surveys in 2024 and 2025. Although the species has not been recorded within the subject land, suitable habitat is available.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							Lagoon Beach at the base of Signal Point, and at the base of Malabar. The habitat consists of honeycombed beach rock partially embedded in the soil, surrounded by Howea palm forest in which there is a thick layer of humus formed by palm and other leaf litter.	
Oligosoma lichenigera	Lord Howe Island Skink	V	V	176	X	The NSW BioNet Atlas holds 176 records of the species within the locality. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	The species occurs in a wide range of forest types including lowland rainforest, montane rainforest and Poa poiformis islets. On the Lord Howe Island mainland they appear restricted to a single, rare habitat type behind Lagoon Beach at the base of Signal Point, and at the base of Malabar. The habitat consists of honeycombed beach rock partially embedded in the soil,	High likelihood of occurrence. The species was recorded within the North Zone during field surveys in 2024 and 2025. Suitable habitat is also available within the South Zone although the species was not recorded during surveys. Although

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							surrounded by Howea palm forest in which there is a thick layer of humus formed by palm and other leaf litter.	the species has not been recorded within the subject land, suitable habitat is available.
Invertebrates								
Gudeoconcha sophiae magnifica	Magnificent Helicarionid Land Snail	CE	CE	-	X	The NSW BioNet Atlas does not hold any records of the species within the locality. The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	The species is associated with the Gnarled Mossy Cloud Forest communities at high altitudes of Mt Gower and Mt Lidgbird. It is typically found on the rainforest floor and living under palm litter.	Low likelihood of occurrence. Suitable habitat is not available within the subject land or study area

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Mystivagor mastersi	Masters Charopid Land Snail	CE	CE	1	X	The NSW BioNet Atlas holds one record of the species within the locality. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	Little is known about the biology and ecology of this very rare species. The species is suggested to be arboreal, but actual habitat requirements are unclear. The species distribution is expected to be confined to Mt Lidgbird and Mount Gower.	Low likelihood of occurrence. The subject land is not located on Mt Lidgbird or Mt Gower.
Placostylus bivaricosus	Lord Howe Placostylus	E	E	41	X	The NSW BioNet Atlas holds 41 records of the species within the locality. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	The species favours damp shaded locations provided by closed canopy. Drypetes/Cryptocarya lowland forest on calcarenite soil is their main habitat. The vegetation at all sites where recent observations have been made is either Kentia Palm (*Howea forsteriana*) closed-forest or Greybark (*Drypetes australasica*) - Blackbutt (*Cryptocarya triplinervis*)	High likelihood of occurrence. The species was recorded within the study area during the 2024 and 2025 field surveys and suitable habitat is present within the subject land.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
							closed-forest or a combination of the two.	
Pseudocharopa ledgbirdi	Mount Lidgbird Charopid Land Snail	CE	CE	7	X	The NSW BioNet Atlas holds seven records of the species within the locality. The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	Little is known about the biology and ecology of this species. It was once common on the summit of Mount Lidgbird where it lived on wet rock surfaces.	Low likelihood of occurrence. The subject land does not comprise suitable habitat for the species.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Pseudocharopa whiteleggei	Whitelegge's Land Snail	CE	CE	4	X	The NSW BioNet Atlas holds four records of the species within the locality. The EPBC PMST identifies that the species or species habitat is likely to occur within the 5km locality.	Little is known about the biology and ecology of this species. It has been recorded living under and inside logs and in moss. The geographic distribution of Whitelegge's Land Snail previously included both Mount Gower and Mount Lidgbird, on Lord Howe Island. However recent survey work suggests the species' geographic distribution has declined so that it is now confined only to Mount Gower.	Low likelihood of occurrence. Previous records of the species are only located at the summit of Mt Gower and Mt Lidgbird, particularly within the Hotbark-Fitzgerald gnarled mossy cloud forests.

Scientific Name	Common Name	Conservation Status		Database Records		Summary of Previous Records	Habitat Requirements	Likelihood of Occurrence
		BC Act Status	EPBC Act Status	BioNet Atlas	PMST			
Pericryptodrilus nanus	Lord Howe Earthworm	CE	CE	-	X	The NSW BioNet Atlas does not hold any records of the species in the locality. The EPBC PMST identifies that the species or species habitat is known to occur within the 5km locality.	The species appears to be entirely confined to, and dependant on Gnarled Mossy Cloud Forest, a CEEC under the BC Act. Gnarled Mossy Cloud Forest occurs only on the summit and ridgelines of Lord Howe Island's two southern peaks, Mount Gower and Mount Lidgbird. The species has only been found on the peak of Mount Gower, where Gnarled Mossy Cloud Forest covers approximately 27 hectares.	Low likelihood of occurrence. The study area is not located within known habitat for the species.

APPENDIX B :
Flora Species List

Table 14 Flora species recorded within the study area

Family	Scientific Name	Common Name	North Zone	South Zone	Exotic
Primulaceae	*Aegiceras corniculatum*	River Mangrove	X	X	-
Apocynaceae	*Alyxia ruscifolia*	Prickly Alyxia	X	X	-
Amaranthaceae	*Amaranthus viridis*	Green Amaranth	X	-	X
Araucariaceae	*Araucaria heterophylla*	Norfolk Island Pine	X	X	X
Aspleniaceae	*Asplenium milnei*	-	X	-	-
Chenopodiaceae	*Atriplex cinerea*	Grey Saltbush	X	-	-
Euphorbiaceae	*Baloghia inophylla*	Brush Bloodwood	X	-	-
Asteraceae	*Bidens pilosa*	Cobbler's Pegs	X	X	X
Poaceae	*Bromus catharticus*	Praire Grass	X	X	X
Brassicaceae	*Cakile edentula*	American Sea Rocket	X	X	X
Asteraceae	*Cassinia tenuifolia*	Bully Bush	X	X	-
Ulmaceae	*Celtis conferta* subsp. *amblyphylla*	Cotton-wood	X	X	-
Poaceae	*Cenchrus clandestinus*	Kikuyu Grass	X	X	X
Caryophyllaceae	*Cerastium glomeratum*	Mouse-ear Chickweed	X	X	X
Poaceae	*Chloris gayana*	Rhodes Grass	X	X	X
Commelinaceae	*Commelina cyanea*	Native Wandering Jew	X	X	-
Asteraceae	*Conyza parva*	Fleabane	X	X	X
Rubiaceae	*Coprosma prisca*	Goatwood	X	X	-
Asteraceae	*Cotula australis*	Common Cotula	X	X	-
Amaryllidaceae	*Crinum pedunculatum*	Swamp Lily	X	X	-
Lauraceae	*Cryptocarya triplinervis* var. *triplinervis*	Blackbutt	X	X	-
Poaceae	*Cynodon dactylon*	Common Couch	X	X	-
Sapindaceae	*Dodonaea viscosa* subsp. *burmanniana*	Hopwood	X	X	-
Putranjivaceae	*Drypetes deplanchei*	Greybark	X	X	-
Poaceae	*Echinochloa crus-galli*	Barnyard Grass	X	X	X
Poaceae	*Ehrharta erecta*	Panic Veldtgrass	X	X	X
Celastraceae	*Elaeodendron curtipendulum*	Tamana	X	X	-
Poaceae	*Eleusine indica*	Crowsfoot Grass	X	-	X
Asteraceae	*Euchiton involucratus*	Star Cudweed	X	X	-
Euphorbiaceae	*Euphorbia cyathophora*	Painted Spurge	X	X	X

Family	Scientific Name	Common Name	North Zone	South Zone	Exotic
Euphorbiaceae	*Euphorbia paralias*	Sea Spurge	X	X	X
Euphorbiaceae	*Euphorbia peplus*	Petty Spurge	X	X	X
Cyperaceae	*Ficinia nodosa*	Knobby Club-rush	X	X	-
Moraceae	*Ficus macrophylla* subsp. *columnaris*	Banyan	X	X	-
Flagellariaceae	*Flagellaria indica*	Whip Vine	X	X	-
Luzuriagaceae	*Geitonoplesium cymosum*	Scrambling Lily	X	X	-
Malvaceae	*Hibiscus tiliaceus*	Cottonwood Hibiscus	X	X	-
Arecaceae	*Howea forsteriana*	Kentia Palm	X	X	-
Apiaceae	*Hydrocotyle bonariensis*	-	X	X	X
Asteraceae	*Hypochaeris radicata*	Catsear	X	X	X
Convolvulaceae	*Ipomoea cairica*	Coastal Morning Glory	X	X	X
Convolvulaceae	*Ipomoea indica*	Morning Glory	X	X	X
Oleaceae	*Jasminum didymum* subsp. *didymum*	-	X	X	-
Malvaceae	*Lagunaria patersonia*	Norfolk Island Hibiscus	X	X	-
Ericaceae	*Leucopogon parviflorus*	Coastal Beard-heath	X	X	-
Liliaceae	*Lilium formosanum*	Formosan Lily	X	X	X
Brassicaceae	*Lobularia maritima*	Sweet Alyssum	X	X	X
Malvaceae	*Malvastrum coromandelianum*	Prickly Malvastrum	X	X	-
Apocynaceae	*Marsdenia rostrata*	Milk Vine	X	X	-
Myrtaceae	*Melaleuca howeana*	Tea Tree	X	X	-
Asteraceae	*Melanthera biflora**	-	X	X	-
Polypodiaceae	*Microsorum pustulatum* subsp. *howense*	-	X	X	-
Polygonaceae	*Muehlenbeckia complexa*	Wire Vine	X	X	-
Scrophulariaceae	*Myoporum insulare*	Common Boobialla	X	X	-
Primulaceae	*Myrsine platystigma*	-	X	X	-
Apocynaceae	*Ochrosia elliptica*	Red Berrywood	X	X	-
Oleaceae	*Olea paniculata*	Native Olive	X	X	-
Poaceae	*Oplismenus imbecillis*	-	X	X	-
Oxalidaceae	*Oxalis corniculata*	Creeping Oxalis	X	X	X

Family	Scientific Name	Common Name	North Zone	South Zone	Exotic
Apocynaceae	*Parsonsia howeana*		X	X	-
Solanaceae	*Physalis peruviana*	Cape Gooseberry	X	X	X
Sapotaceae	*Planchonella howeana*	Axe-handle Wood	X	X	-
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	X	X	X
Poaceae	*Poa annua*	Winter Grass	X	X	X
Psilotaceae	*Psilotum nudum*	Skeleton Fork-Fern	X	-	-
Smilacaceae	*Smilax australis*	Lawyer Vine	X	X	-
Solanaceae	*Solanum nigrum*	Black-berry Nightshade	X	X	X
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	X	X	X
Poaceae	*Spinifex sericeus*	Hairy Spinifex	X	X	-
Poaceae	*Sporobolus africanus*	Parramatta Grass	X	X	X
Poaceae	*Sporobolus virginicus*	-	X	X	-
Poaceae	*Stenotaphrum secundatum*	Buffalo Grass	X	X	X
Menispermaceae	*Stephania japonica*	Snake vine	X	X	-
Asteraceae	*Taraxacum officinale*	Dandelion	X	X	X
Aizoaceae	*Tetragonia tetragonioides*	New Zealand Spinach	X	-	-
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	X	X	X
Moraceae	*Trophis scandens* subsp. *megacarpa*	-	X	X	-
Apocynaceae	*Tylophora biglandulosa*	-	X	X	-
Fabaceae (Faboideae)	*Vigna marina*	Dune Bean	X	X	-
Asteraceae	*Wollastonia biflora*	-	X	-	-

APPENDIX C :
Fauna Species List

Table 15 Fauna species recorded during targeted surveys within the study area

Family	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Origin	North Zone	South Zone
Birds							
Scolopacidae	*Limosa lapponica baueri*	Bar-tailed Godwit (baueri)	E	E, M	Non-endemic Native	-	X
Laridae	*Anous minutus*	Black Noddy	-	-	Non-native	X	X
Procellariidae	*Pterodroma nigripennis*	Black-winged Petrel	V	-	Non-native	X	-
Rallidae	*Hypotaenidia philippensis*	Buff-banded Rail	-	-	Non-native	X	X
Laridae	*Anous stolidus*	Common Noddy	-	M	Non-endemic Native	-	X
Charadriidae	*Charadrius bicinctus*	Double-banded Plover	-	M	Non-endemic Native	-	X
Columbidae	*Chalcophaps indica*	Emerald Dove	-	-	Non-endemic Native	X	-
Turdidae	*Turdus merula*	Eurasian Blackbird	-	-	Non-native	X	-
Pachycephalidae	*Pachycephala pectoralis contempta*	Golden Whistler (Lord Howe Is. subsp.)	V	-	Endemic Native	X	X
Phalacrocoracidae	*Phalacrocorax carbo*	Great Cormorant	-	-	Non-native	X	-
Phalacrocoracidae	*Phalacrocorax sulcirostris*	Little Black Cormorant	-	-	Vagrant/Irregular Visitor	X	-
Rallidae	*Hypotaenidia sylvestris*	Lord Howe Woodhen	E	E	Endemic Native	X	X
Monarchidae	*Grallina cyanoleuca*	Magpie-lark	-	-	Non-native	X	X
Sulidae	*Sula dactylatra*	Masked Booby	V	M	Non-endemic Native	-	X
Charadriidae	*Vanellus miles*	Masked Lapwing	-	-	Non-native	-	X
Charadriidae	*Pluvialis fulva*	Pacific Golden Plover	-	M	Non-endemic Native	X	X
Artamidae	*Strepera graculina crissalis*	Pied Currawong (Lord Howe Is. subsp.)	V	V	Endemic Native	-	X

Family	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Origin	North Zone	South Zone
Rallidae	*Porphyrio porphyrio*	Purple Swamphen	-	-	Non-native	-	X
Scolopacidae	*Arenaria interpres*	Ruddy Turnstone	V	V, M	Non-endemic Native	-	X
Alcedinidae	*Todiramphus sanctus*	Sacred Kingfisher	-	-	Non-native	-	X
Zosteropidae	*Zosterops lateralis tephropleurus*	Silvereye (Lord Howe Is. subsp.)	V	-	Endemic Native	X	X
Laridae	*Onychoprion fuscata*	Sooty Tern	V	-	Non-endemic Native	X	X
Procellariidae	*Ardenna pacifica*	Wedge-tailed Shearwater	-	M	Non-endemic Native	X	X
Hirundinidae	*Hirundo neoxena*	Welcome Swallow	-	-	Non-native	X	X
Scolopacidae	*Numenius phaeopus*	Whimbrel	-	M	Non-endemic Native	-	X
Laridae	*Gygis alba*	White Tern	V	-	Non-native	X	X
Ardeidae	*Egretta novaehollandiae*	White-faced Heron	-	-	Non-native	X	-
Scolopacidae	*Tringa incana*	Wandering Tattler	-	M	Non-endemic Native	X	-
Reptiles							
Scincidae	*Oligosoma lichenigera*	Lord Howe Island Skink	V	V	Non-endemic Native	X	-
Gekkonidae	*Christinus guentheri*	Lord Howe Island Gecko	V	V	Non-endemic Native	X	X
Scincidae	*Lampropholis delicata*	Dark-flecked Garden Sunskink	-	-	Non-native	X	-
Invertebrates							
Bulimulidae	*Placostylus bivaricosus*	Lord Howe Placostylus	E	E	Endemic Native	X	X

V = Vulnerable, E = Endangered, M = Migratory

APPENDIX D :
Tests of Significance

D.1. Introduction

This appendix presents formal Tests of Significance required under Section 7.3 of the BC Act, that have been prepared in accordance with the *Threatened Species Test of Significance Guidelines* (NSW Government 2018). The Test of Significance provides a means by which to gauge the significance of predicted impacts to threatened species and communities listed under the BC Act.

Both direct and indirect impacts are considered within these assessments. Direct impacts have been quantified within the assessments and are represented by the development footprint boundary (i.e. the subject land). Whilst it is acknowledged that indirect impacts can potentially be significant for a variety of species, such impacts cannot be mapped or accurately calculated in advance.

Threatened species known to occur within the subject land, or with the potential to be impacted directly or indirectly by the Project are listed below. No threatened flora species or TECs are considered likely to be impacted by the Project.

Threatened Fauna

- Lord Howe Woodhen;
- Golden Whistler (Lord Howe Is. subsp.);
- Pied Currawong (Lord Howe Is. subsp.);
- Silvereye (Lord Howe Is. subsp.);
- White Tern;
- Sooty Tern;
- Black-winged Petrel;
- Ruddy Turnstone;
- Bar-tailed Godwit;
- Masked Booby;
- Lord Howe Placostylus;
- Lord Howe Island Gecko; and
- Lord Howe Island Skink.

Due to similar habitat requirements, some of the above threatened species have been grouped together and assessed collectively in the following Tests of Significance. Each component of the test of significance is provided in italicised text, and a response supplied beneath in plain text.

D.1.1. Lord Howe Island Woodhen

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

The Lord Howe Woodhen occurs within all vegetation communities within the subject land, as well as in cleared land and on beaches. The species has become highly abundant across the island due to the successful captive breeding program as well as the eradication of the Black Rat (*Rattus rattus*), with nearly 6,000 records of the species in the locality held within the NSW BioNet. While the population of the species was reduced to just nine breeding pairs in the 1970's, the latest survey undertaken in December 2024 recorded at least 1,638 woodhens, including 1,535 adults and juveniles and 26 chicks. The species was regularly observed foraging and roosting within the subject land as well as modified urban habitats around the community including sporting fields, garden beds and golf courses.

The local population of the Lord Howe Woodhen extends across Lord Howe Island and has been assessed as viable. Thes species has the potential to be impacted by the Project through the removal of up to 2.57 ha of known foraging and breeding habitat, including 0.75 ha of native vegetation and 1.81 ha of exotic vegetation. Given the extensive areas of suitable habitat within the study area and wider locality, the removal of a small area of habitat within the subject land is not considered to be important for the long-term survival of the species within the locality. Furthermore, revegetation is proposed as part of the Project's Landscape and Urban Design Plan to ensure a no net loss in native vegetation within the study area. Accordingly, the Project Is not considered to have an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable

(c) in relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality

The Project will remove up to a maximum of 2.57 ha of known foraging and breeding habitat within the subject land for the Lord Howe Island Woodhen. This includes 0.75 ha of native vegetation and 1.81 ha of exotic vegetation. This has been determined as the maximum extent of clearing and a focus will be placed on retaining additional areas of native vegetation and associated habitat during further design phases. Furthermore, this extent includes sections of overhanging canopy within the South Zone which will be retained by the project.

The Project may result in further fragmentation with vegetation clearing proposed along the edges of previously fragmented patches. While the Lord Howe Island Woodhen is a flightless bird, the species is a highly mobile species capable of moving between fragmented patches of remnant native vegetation, with the species regularly observed foraging within areas of exotic grassland and within urban areas around houses, crossing roads and hardstand areas. Accordingly, the Project will not remove, modify, fragment or isolate important habitat.

The small area of habitat to be removed within the subject land is not considered to be important for the long-term survival of the species. The subject land is located within lowland areas that have been subject to previous disturbance and large areas of intact habitat will remain available around urban areas and in the mountainous areas of the island. Given the World Heritage status of the island, these areas of habitat will remain protected in the long term.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

The BC Act currently lists the following AOBVs:

- Gould's Petrel habitat;
- Little Penguin population in Sydney's North Harbour habitat;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve; and
- Wollemi Pine habitat.

The Project is not located within or in proximity to the aforementioned AOBVs and is therefore not likely to have an adverse effect on any AOBVs.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

The Project will result in the following key threatening process:

- Clearing of native vegetation

Whilst the Project will result in this key threatening process, the increase in impacts of this process are considered minimal. Large areas of the subject land have previously been cleared and comprises regrowth vegetation. Whilst these areas have regenerated into relatively naturally occurring communities, they have been subject to disturbance. Nevertheless, the removal of native vegetation is minimal with efforts made during the initial project planning phases to avoid native vegetation as much as possible. Although some removal of

native vegetation will occur, no significant impacts resulting from this key threatening process are considered likely to occur as a result of the Project.

Conclusion

The Project will remove up to a maximum of 2.57 ha of known foraging and breeding habitat within the subject land for the Lord Howe Woodhen. This includes 0.75 ha of native vegetation and 1.81 ha of exotic vegetation. The habitat to be removed is considered to be a very small area of suitable habitat available in the study area and wider locality, with the species likely to occur across almost all vegetation communities on the island. The species has been recorded within urban areas utilising modified gardens, areas of mown lawn and even within hardstand areas and on roads. While the Project will result in the removal of native vegetation and associated habitat, this is expected to be a short term impact, as the Project includes revegetation as part of its Landscape and Urban Design Plan to ensure there Is no net loss of native vegetation within the subject land.

Based on the current population growth trends of the Lord Howe Woodhen, particularly following the eradication of the Black Rat, and abundance of suitable habitat, the species population is expected to continue to rise. Subsequently, the Project is not considered likely to result in a significant impact to the Lord Howe Woodhen.

D.1.2. Woodland Birds

The following threatened species have been assessed collectively in the following Test of Significance:

- Golden Whistler (Lord Howe Is. subsp.);
- Pied Currawong (Lord Howe Is. subsp.); and
- Silvereye (Lord Howe Is. subsp.).

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

The Golden Whistler (Lord Howe Is. subsp.), Pied Currawong (Lord Howe Is. subsp.) and Silvereye (Lord Howe Is. subsp.) are all woodland birds that are known to occur within the subject land. These species are all highly mobile species capable of accessing habitat resources from the wider locality and are unlikely to rely solely on the small area (approximately 0.65 ha) of native vegetation within the subject land. Furthermore, the habitat within the subject land comprises predominantly regrowth vegetation within disturbed urban areas. These woodland birds are more likely to rely on larger areas of intact high-quality habitat in the wider locality. The habitat to be removed for the Project represents a very small portion of potential foraging and nesting habitat that is available in the locality.

Furthermore, revegetation is proposed as part of the Project's Landscape and Urban Design Plan to ensure a no net loss in native vegetation within the study area. Accordingly, the Project is not considered to have an adverse effect on the life cycle of any of these three species such that a viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable.

(c) in relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality

Approximately 0.65 ha of native vegetation that provides suitable habitat for these species will be removed from the subject land. This has been determined as the maximum extent of clearing and a focus will be placed on retaining additional areas of native vegetation and associated habitat during further design phases. Furthermore, this extent includes sections of overhanging canopy within the South Zone which will be retained by the project. Nevertheless, revegetation is proposed as part of the Project's Landscape and Urban Design Plan to ensure a no net loss in native vegetation within the study area, which will therefore continue to provide foraging and breeding habitat for the Golden Whistler (Lord Howe Is. subsp.), Pied Currawong (Lord Howe Is. subsp.) and Silvereye (Lord Howe Is. subsp.) in the long term.

The Project may result in further fragmentation with vegetation clearing proposed along the edges of previously fragmented patches however will not result in further isolation of existing habitat. The potential habitat on the subject land represents only a very small area available to the species in the locality and as the species are highly mobile and access resources from across a vast foraging range, the project is not likely to decrease the movement of individuals across the locality. Accordingly, the Project will not remove, modify, fragment or isolate important habitat.

The small area of habitat to be removed within the subject land is not considered to be important for the long-term survival of the species. The subject land is located within lowland areas which have been subject to disturbance and large areas of intact habitat will remain available around urban areas and in the mountainous areas of the island. Given the World Heritage status of the island, these areas of habitat will remain protected in the long term.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

The BC Act currently lists the following AOBVs:

- Gould's Petrel habitat;
- Little Penguin population in Sydney's North Harbour habitat;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve; and
- Wollemi Pine habitat.

The Project is not located within or in proximity to the aforementioned AOBVs and is therefore not likely to have an adverse effect on any AOBVs.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

The Project will result in the following key threatening process:

- Clearing of native vegetation

Whilst the Project will result in this key threatening process, the increase in impacts of this process are considered minimal. Large areas of the subject land have previously been cleared and comprises regrowth vegetation. Whilst these areas have regenerated into relatively naturally occurring communities, they have been subject to disturbance. Nevertheless, the removal of native vegetation is minimal with efforts made during the initial project planning phases to avoid native vegetation as much as possible. Although some removal of native vegetation will occur, no significant impacts resulting from this key threatening process are considered likely to occur as a result of the Project.

Conclusion

The Golden Whistler (Lord Howe Is. subsp.), Pied Currawong (Lord Howe Is. subsp.) and Silvereye (Lord Howe Is. subsp.) are all woodland birds that are known to occur within the subject land. A small area (approximately 0.65 ha) of native vegetation that provides suitable habitat for these species will be removed from the subject land. While the Project will result in the removal of native vegetation and associated habitat, this is expected to be a short-term impact, as the Project includes revegetation as part of its Landscape and Urban Design Plan to ensure there Is no net loss of native vegetation within the subject land.

These species are all highly mobile and are unlikely to rely solely on the habitat within the subject land. Despite the removal of a small area of suitable habitat within the subject land, larger areas are available within the study area and wider locality which will be managed and protected in the long term. Therefore, the Project is not likely to have a significant impact upon these threatened woodland bird species.

D.1.3. Seabirds

The following threatened species have been assessed collectively in the following Test of Significance:

- Black-winged Petrel;

- Sooty Tern; and
- Masked Booby.

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

The Sooty Tern and Black-winged Petrel were both recorded aerially above the subject land, while the Masked Booby was recorded aerially within the study area, all of which were considered to be in transit between foraging sites. Habitat for these three species is limited to a very small area of foraging habitat (approximately 0.89 ha) within the lagoon adjacent to the existing jetty. The Sooty Tern is also known to roost on beaches, however the species was not recorded roosting within the subject land and given the species has known roosting/breeding sites at Ned's Beach and Blinky Beach on the eastern side of the island, the small area of beach habitat within the subject land is not considered to be used as roosting habitat. Furthermore, no roosting habitat is available for the Black-winged Petrel or the Masked Booby. Potential habitat for these three species may be reduced marginally; however these impacts are largely restricted to short term impacts during construction of the marine infrastructure and foraging habitat within the lagoon and wider ocean will be available in the long-term. Accordingly, the Project is not considered to have an adverse effect on the life cycle of either of these species such that a viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable.

(c) in relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality

The subject land comprises a very small area of foraging habitat for the Sooty Tern, Black-winged Petrel and Masked Booby. These species were only recorded flying aerially above and adjacent to the subject land in transit between foraging grounds. Within the subject land, suitable habitat is limited approximately 0.89 ha of foraging habitat within the lagoon adjacent to the existing jetty. These species are all pelagic foragers and

therefore are extremely unlikely to rely on the small area of the lagoon within the subject land for foraging. The Sooty Tern is also known to roost on beaches, however the species was not recorded roosting within the subject land and given the species have known roosting/breeding sites at Ned's Beach and Blinky Beach on the eastern side of the island, the small area of beach within the subject land is not considered to be used as roosting habitat. No suitable roosting or breeding habitat is available for the Black-winged Petrel or Masked Booby.

The foraging habitat available for Sooty Tern, Black-winged Petrel and Masked Booby will not be fragmented or isolated from other areas of suitable foraging habitat.

The small area of habitat to be removed within the subject land is not considered to be important for the long-term survival of the species. Only a small area of the lagoon will be impacted for construction of the new jetty, and impacts will predominantly be short-term during the construction phase. Large areas of suitable habitat will remain within the Lagoon and wider locality which provide more suitable foraging habitat. Therefore the habitat to be impacted by the Project is not considered important for the long-term survival of these species in the locality.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

The BC Act currently lists the following AOBVs:

- Gould's Petrel habitat;
- Little Penguin population in Sydney's North Harbour habitat;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve; and
- Wollemi Pine habitat.

The Project is not located within or in proximity to the aforementioned AOBVs and is therefore not likely to have an adverse effect on any AOBVs.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

The Project will result in the following key threatening process:

- Clearing of native vegetation

Whilst the Project will result in this key threatening process, these impacts are considered minimal and will not affect the Sooty Tern, Black-winged Petrel or Masked Booby. Nevertheless, the removal of native vegetation within the subject land is minimal with efforts made during the initial project planning phases to avoid native vegetation as much as possible. Although some removal of native vegetation will occur, no significant impacts resulting from this key threatening process are considered likely to occur as a result of the Project.

<u>Conclusion</u>

The Sooty Tern, Black-winged Petrel and Masked Booby were recorded aerially above and/or adjacent to the subject land, in transit between foraging sites. Habitat for these three species is limited to a very small area of foraging habitat (approximately 0.89 ha), albeit marginal within the lagoon adjacent to the existing jetty. The Sooty Tern is also known to roost on beaches, however the species was not recorded roosting within the subject land and given the species have known roosting/breeding sites at Ned's Beach and Blinky Beach on the eastern side of the island, the small area of beach within the subject land is not considered to be used as roosting habitat. Potential habitat for these species may be reduced marginally; however these impacts are largely restricted to short term impacts during construction of the marine infrastructure and foraging habitat within the lagoon will be available in the long term. Therefore, the Project is not likely to have a significant impact upon these three threatened seabirds.

D.1.4. White Tern

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

The White Tern has been recorded roosting and breeding within the subject land. Approximately 1.10 ha of suitable habitat is available within the subject land, including 0.89 ha of foraging habitat and 0.21 ha of roosting/breeding habitat. The species predominantly utilises the exotic Norfolk Island Pine trees for roosting and breeding, of which one tree comprising 0.01 ha will be removed within the subject land. While one Norfolk Island Pine tree will be removed within the subject land comprising 0.01 ha, a further four Norfolk Island Pine trees covering 0.20 ha will be retained within the subject land which will continue to provide suitable roosting and breeding habitat for the White Tern in the long term. Within the North Zone, the White Tern was only recorded within the Norfolk Island Pine trees, however, the species also utilises bare branches on other trees and shrubs for breeding. The Project has been designed to avoid native vegetation to the largest extent possible and therefore large areas of suitable roosting and breeding habitat have been retained within the study area. Furthermore, large areas of suitable habitat including a significant number of Norfolk Island Pine trees are available beyond the study area in close proximity to the lagoon which are also known to be used by the White Tern for roosting and breeding. Given the large areas of available habitat retained within the study area and wider locality, the removal of one Norfolk Island Pine tree is not considered to have a significant impact on the White Tern.

Furthermore, the White Tern has not been observed foraging within the subject land, however areas of water in the North Zone within the lagoon provide potential foraging habitat. Impacts to foraging habitat will be predominantly short term, limited to the construction phase of the Project and given the large areas of suitable foraging habitat within the locality, the Project is not considered to have a significant impact on foraging habitat. Accordingly, the Project Is not considered to have an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable.

(c) in relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality

The Project will remove up to 0.90 ha of suitable habitat within the subject land, including 0.89 ha of foraging habitat and 0.01 ha of roosting/breeding habitat. This has been determined as the maximum extent of clearing and the Project has been designed to retain the majority of Norfolk Island Pine trees which provide roosting and breeding habitat.

The White Tern is a highly mobile species that forages over the ocean however returns to land to roost and breed. On Lord Howe Island, the species predominantly utilises the exotic Norfolk Island Pine trees for roosting and breeding, of which one tree will be removed and three trees retained within the subject land. Although the species also utilises bare branches on other trees and shrubs, all records of the species roosting within the subject land were within Norfolk Island Pine trees, and therefore the Project has been designed to retain the Norfolk Island Pine trees where possible. The removal of vegetation within the subject land will not result in the fragmentation of roosting and breeding habitat for the White Tern. Only one Norfolk Island Pine Tree is proposed to be removed, of which is located on the edge of a patch of pine trees. Given the species is highly mobile and utilises Norfolk Island Pine trees that occur along the whole lagoon, the removal of one Norfolk Island Pine tree is not considered to affect the species ability to access other roosting and breeding habitat. While the Project will include the development of new marine infrastructure, thereby modifying the nature of the habitat within the subject land, the accessibility including flyways between foraging resources in the Lagoon and roosting/breeding sites within the Norfolk Island Pine trees, will be similar to exiting conditions.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

The BC Act currently lists the following AOBVs:

- Gould's Petrel habitat;
- Little Penguin population in Sydney's North Harbour habitat;

- Mitchell's Rainforest Snail in Stotts Island Nature Reserve; and
- Wollemi Pine habitat.

The Project is not located within or in proximity to the aforementioned AOBVs and is therefore not likely to have an adverse effect on any AOBVs.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

The Project will result in the following key threatening process:

- Clearing of native vegetation

Whilst the Project will result in this key threatening process, the increase in impacts of this process are considered minimal. Furthermore, the roosting and breeding habitat within the subject land is present within the exotic Norfolk Island Pine trees, of which only one tree is proposed to be removed, and three trees retained within the subject. Whilst areas of native vegetation within the subject land have regenerated into relatively naturally occurring communities, they have been subject to previous disturbance. Nevertheless, the removal of native vegetation is minimal with efforts made during the initial project planning phases to avoid native vegetation as much as possible. Although some removal of native vegetation will occur, no significant impacts resulting from this key threatening process are considered likely to occur as a result of the Project.

Conclusion

Approximately 0.1 ha, comprised of one Norfolk Island Pine tree within the North Zone, will be removed form the subject land which provides suitable roosting and breeding habitat for the White Tern. While the Norfolk Island Pine trees are an introduced tree species on the island, White Terns predominantly use the Norfolk Island Pines as for roosting and breeding. While one Norfolk Island Pine tree will be removed within the subject land comprising 0.01 ha, a further four Norfolk Island Pine Trees covering 0.20 ha will be retained within the subject land which will continue to provide suitable roosting and breeding habitat for the White Tern in the long term. The Project has been designed to avoid native vegetation to the largest extent possible and therefore large areas of suitable roosting and breeding habitat have been retained within the study area. Furthermore, large areas of suitable habitat including a significant number of Norfolk Island Pine trees are available beyond the study area in close proximity to the lagoon which are also known to be used by the White Tern for roosting and breeding. Given the large areas of available habitat retained within the subject land, study area and wider locality, the removal of one Norfolk Island Pine tree is not considered to have a significant impact on the White Tern.

The White Tern has not been observed foraging within the subject land, however areas of water in the North Zone within the lagoon (approximately 0.89 ha) provide potential foraging habitat. Impacts to foraging habitat will be predominantly short term, limited to the construction phase of the Project and given the large areas of suitable foraging habitat within the locality, the Project is not considered to have a significant impact on foraging habitat for the White Tern.

D.1.5. Shorebirds

The following threatened species have been assessed collectively in the following Test of Significance:

- Ruddy Turnstone; and
- Bar-tailed Godwit.

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

The Ruddy Turnstone and Bar-tailed Godwit were both recorded within the study area. Both species were only recorded within the South Zone, foraging within tidal areas of the beach. While the Ruddy Turnstone was recorded along the beach in both the northern and southern portions of the South Zone, the Bar-tailed Godwit was only recorded in the southern portion around Cobbys Creek. Both species were recorded on multiple occasions, however the species was only recorded within the tidal areas of the beach. Within the South Zone, the subject land does not include any section of beach and therefore no suitable habitat is available for the species within the subject land in the South Zone. While these two species were not observed within the North Zone, the subject land does include a small section of beach habitat within the tidal zone that offers potential foraging habitat (approximately 0.34 ha) for these two species.

Potential habitat for these two species may be reduced marginally; however these impacts are largely restricted to short term impacts during construction of the marine infrastructure and larger areas of more suitable foraging habitat will be available in the long-term. Accordingly, the Project is not considered to have an adverse effect on the life cycle of either of these species such that a viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable.

(c) in relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality

The subject land comprises a very small area of foraging habitat for the Ruddy Turnstone and Bar-tailed Godwit. These species were only recorded in the South Zone, while potential habitat is only available in the North Zone. While these species have the potential to utilise the habitat in the North Zone, it is only a small area of beach habitat adjacent to the existing jetty, which will remain available in the long term. As such the potential foraging habitat for these two species will not be fragmented or isolated from other areas of suitable foraging habitat.

The small area of habitat (0.34 ha) to be removed within the subject land is not considered to be important for the long-term survival of the species. Only a small area of the beach habitat will be impacted for construction of the new jetty, and impacts will predominantly be short-term during the construction phase. Large areas of suitable habitat will remain within wider locality which provide more suitable foraging habitat. Therefore the habitat to be impacted by the Project is not considered important for the long-term survival of these species in the locality.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

The BC Act currently lists the following AOBVs:

- Gould's Petrel habitat;
- Little Penguin population in Sydney's North Harbour habitat;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve; and
- Wollemi Pine habitat.

The Project is not located within or in proximity to the aforementioned AOBVs and is therefore not likely to have an adverse effect on any AOBVs.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

The Project will result in the following key threatening process:

- Clearing of native vegetation

Whilst the Project will result in this key threatening process, these impacts are considered minimal and will not affect the Ruddy Turnstone or Bar-tailed Godwit, as these areas do not provide habitat for these two species. Nevertheless, the removal of native vegetation within the subject land is minimal with efforts made during the initial project planning phases to avoid native vegetation as much as possible. Although some removal of native vegetation will occur, no significant impacts resulting from this key threatening process are considered likely to occur as a result of the Project.

<u>Conclusion</u>

The Ruddy Turnstone and Bar-tailed Godwit were recorded within the study area and considered to have potential to occur on occasion within the subject land in areas comprising beach habitat. Potential habitat for these species may be reduced marginally; however these impacts are largely restricted to short term impacts during construction of the marine infrastructure and areas of the beach comprising foraging habitat will be available in the long term. Therefore, the Project is not likely to have a significant impact upon these two threatened shorebirds.

D.1.6. Lord Howe Placostylus

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

The Lord Howe Placostylus was not recorded within the subject land, however was recorded 41 times within the study area and immediately adjoining vegetation during targeted surveys for the Project. The species was predominantly recorded in the South Zone in vegetation adjoining the WMF, both within the subject land and wider study area. Within the North Zone, the species has only been recorded in vegetation between the boat ramp and Old Settlement Beach outside of the subject land. The species was identified within the same few locations across multiple survey periods and despite thorough searches in surrounding areas, the area of occupancy did not increase.

A small area of potential habitat (0.42 ha) will be removed from the subject land to facilitate the Project; however this habitat is located beyond the known area of occupancy of the local populations. Furthermore, habitat around the perimeter of the existing waste facility that is subject to the proposed action comprise more degraded areas of habitat due to edge effects. These areas were found to have shallow litter cover, while rubbish and exotic grasses and weeds were also present.

There are large areas habitat to be retained within the study area (3.49 ha), both within the North Zone and South Zone, which have large quantities of old, empty Lord Howe Placostylus shells, suggesting these areas comprise suitable habitat and would have been occupied by the species prior to the invasion of Black Rat. Therefore, large areas of suitable habitat will be retained within the study area. Accordingly, the Project Is not considered to have an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable.

(c) in relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality

Approximately 0.42 ha of potential habitat for the Lord Howe Placostylus will be removed within the subject land. This has been determined as the maximum extent of clearing and a focus will be placed on retaining additional areas of native vegetation and associated habitat during further design phases. Furthermore, this extent includes sections of overhanging canopy within the South Zone which will be retained by the Project.

The habitat to be removed is located outside of the know area of occurrence for the species, however did contain high numbers of empty shells. The Lord Howe Placostylus is not highly mobile and known populations occur within the wider study area in both the North and South Zones. The Project may result in fragmentation of suitable habitat, with vegetation clearing proposed along the edges of previously fragmented patches. However, as stated, the vegetation to be cleared is outside of the known area of occupancy for the species and large areas of good quality habitat (3.49 ha) will remain available within the study area. As such, the small area of suitable habitat to be removed within the subject land is not considered to be important for the long-term survival of the species. Given the World Heritage status of the island, suitable habitat within the study area will continue to provide habitat for the species of which will remain protected in the long term.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

The BC Act currently lists the following AOBVs:

- Gould's Petrel habitat;
- Little Penguin population in Sydney's North Harbour habitat;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve; and
- Wollemi Pine habitat.

The Project is not located within or in proximity to the aforementioned AOBVs and is therefore not likely to have an adverse effect on any AOBVs.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

The Project will result in the following key threatening process:

- Clearing of native vegetation

Whilst the Project will result in this key threatening process, the increase in impacts of this process are considered minimal. The vegetation to be removed is located outside of the known area of occupancy of the species. Given the low mobility of the species, it is unlikely that the habitat to be removed within the subject land would be used by the species in the short term. While introduced predators such as the Black Rat have been eradicated, it is possible that the population of the Lord Howe Placostylus will continue to grow in the long term and extend beyond the current area of occupancy. Nevertheless, the removal of native vegetation is minimal with efforts made during the initial project planning phases to avoid native vegetation and habitat as much as possible. Although some removal of native vegetation will occur, no significant impacts resulting from this key threatening process are considered likely to occur as a result of the Project.

Conclusion

The Project will remove up to 0.42 ha of suitable habitat within the subject land for the Lord Howe Placostylus. The habitat to be removed is considered to be a very small area of suitable habitat available in the study area and wider locality, While the Project may potentially reduce the extent of habitat available for the species, it is not likely to fragment the exiting population into two or more populations as the disturbance occurs beyond the current area of occupancy. As such, the extent of habitat available to the population may be reduced, however the known area of occupancy will not be reduced.

Large areas of suitable habitat will be retained within the study area (3.49 ha), both within the North Zone and South Zone, which have large quantities of old, empty Lord Howe Placostylus shells, suggesting these areas comprise suitable habitat and would have been occupied by the species prior to the invasion of Black Rat. Therefore, large areas of suitable habitat will be retained within the study area.

While the Project will result in the removal of native vegetation and associated habitat, this is expected to be a short-term impact, as the Project includes revegetation as part of its Landscape and Urban Design Plan to ensure there is no net loss of native vegetation and associated habitat within the subject land. Subsequently, the Project is not considered likely to result in a significant impact to the Lord Howe Placostylus.

D.1.7. Reptiles

The following threatened species have been assessed collectively in the following Test of Significance:

- Lord Howe Island Gecko; and
- Lord Howe Island Skink.

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

The Lord Howe Island Skink and Lord Howe Island Gecko were not recorded within the subject land, however, were recorded in areas immediately adjacent to the subject land and are considered to have the potential to occur. Approximately 6.73 ha of suitable habitat is available within the study area, with approximately 0.80 ha proposed to be removed within the subject land. Habitat mapped for these species has included grassy and shrubby communities on the beach margin which is described as potential habitat for both species in the Lord

Howe Island Biodiversity Management Plan. However, records of the species during field surveys suggest that they favour closed forests with higher levels of litter, calcarenite outcropping and an abundance of trees/palms, of which have largely been avoided through the design of the Project.

The Lord Howe Island Skink has not been recorded within the subject land; however the species was recorded six (6) times within the study area during field surveys in December 2024 and January 2025. The NSW BioNet Atlas holds a further 176 records within the locality. The Lord Howe Island Gecko has been recorded eight (8) times within the study area, including six (6) records in the North Zone and two (2) records within the South Zone. No records are located within the subject land. A further 16 records of the species were made during surveys within Steven's reserve and in bushland behind the Lord Howe Island Board offices on the track towards Transit Hill. The NSW BioNet Atlas holds a further 133 records of the species in the locality. The habitat to be removed within the subject land is considered to comprise a very small area of suitable habitat for the species and large areas of known habitat will be retained within the study area and wider locality. Given the species was not recorded within the subject land, the Project Is not considered to have an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable.

(c) in relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality

The Project will remove up to a maximum of 0.80 ha of potential habitat within the subject land for the Lord Howe Island Skink and Lord Howe Island Gecko. This has been determined as the maximum extent of clearing and a focus will be placed on retaining additional areas of native vegetation and associated habitat during further design phases. Furthermore, this extent includes sections of overhanging canopy within the South Zone which will be retained by the project. The habitat to be removed within the subject land is located on predominantly coral sandy soils with grassy and shrubby vegetation. These areas do not contain calcarenite rock, with the exception of areas along the beach which are tidal. Furthermore, these areas have generally low litter cover, and therefore are not considered to provide optimal shelter habitat for these two reptile species.

Nevertheless, a precautionary approach has been taken to identify potential habitat for these species and therefore all areas of native vegetation within the subject land have been considered as potential habitat.

The Project may result in further fragmentation with vegetation clearing proposed along the edges of previously fragmented patches. Neither of these species have been recorded within the subject land however, both species are considered capable of accessing these fragmented patches, predominantly along the edges of the rocky foreshore.

Neither the Lord Howe Island Skink or Lord Howe Island Gecko have been recorded within the subject land, While potential habitat is available, these areas are already fragmented and have been subject to previous disturbance. Larger areas of intact habitat area available within the study area and wider locality which will remain available, and given the World Heritage status of the island, will remain protected in the long term. As such, the subject land is not considered important for the long-term survival of these species.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

The BC Act currently lists the following AOBVs:

- Gould's Petrel habitat;
- Little Penguin population in Sydney's North Harbour habitat;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve; and
- Wollemi Pine habitat.

The Project is not located within or in proximity to the aforementioned AOBVs and is therefore not likely to have an adverse effect on any AOBVs.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

The Project will result in the following key threatening process:

- Clearing of native vegetation

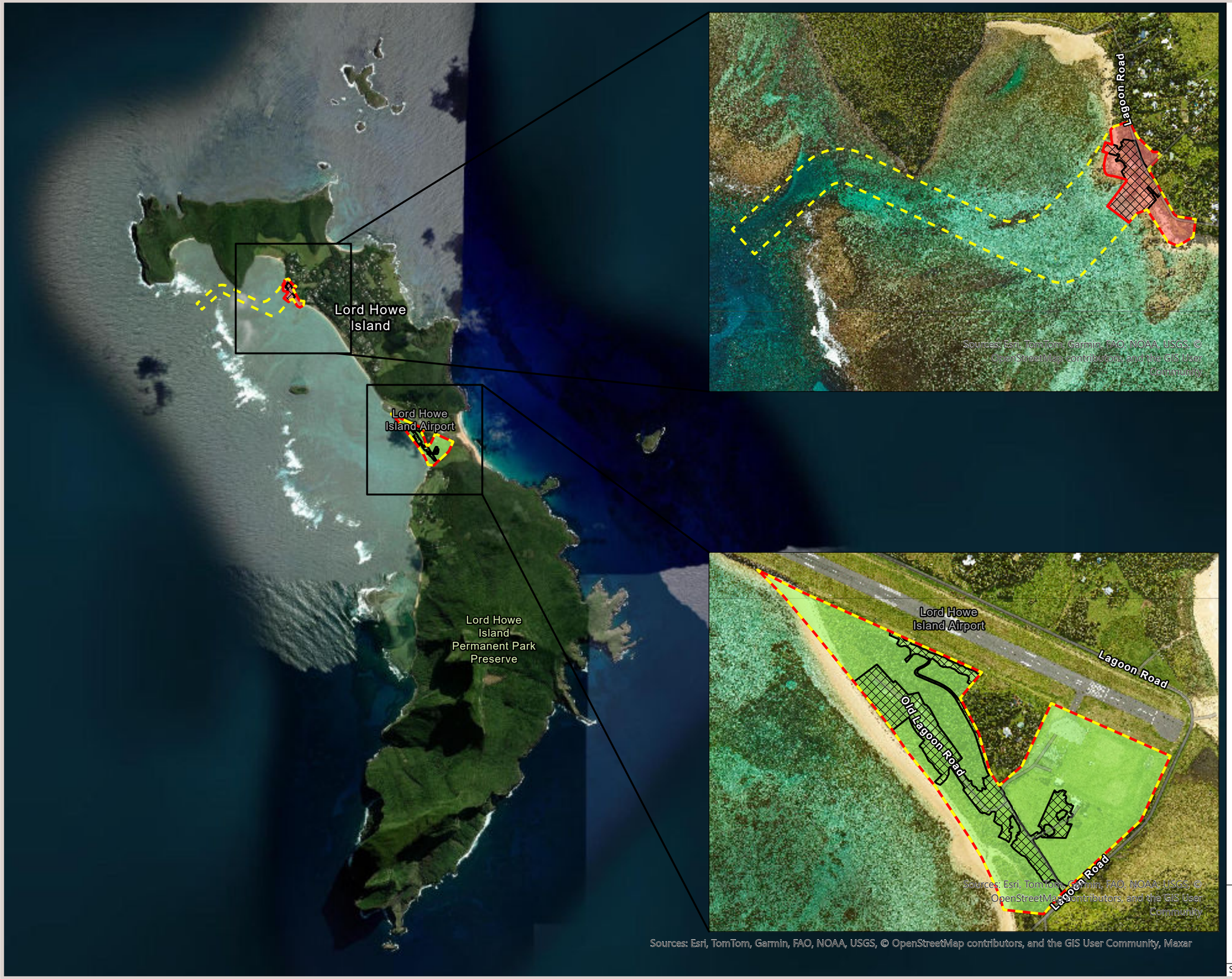
Whilst the Project will result in this key threatening process, the increase in impacts of this process are considered minimal. Large areas of the subject land have previously been cleared and comprises regrowth vegetation. Whilst these areas have regenerated into relatively naturally occurring communities, they have been subject to disturbance and neither the Lord Howe Island Skink or Lord Howe Island Gecko have been recorded. Nevertheless, the removal of native vegetation is minimal with efforts made during the initial project planning phases to avoid native vegetation as much as possible. Although some removal of native vegetation will occur, the vegetation is considered to be sub-optimal given shelter habitat is minimal, and it is located outside of the known area of occupancy of the species. Subsequently, no significant impacts resulting from this key threatening process are considered likely to occur as a result of the Project.

Conclusion

The Project will remove up to 0.80 ha of potential habitat within the subject land for the Lord Howe Island Skink and Lord Howe Island Gecko. The habitat to be removed is considered to be a very small area of potential habitat available compared to the large areas of intact habitat available in the study area and wider locality, While the Project may potentially reduce the extent of habitat available for these species, it is considered sub-optimal habitat due the absence of favoured shelter habitat (i.e. calcarenite rock and dense litter) and is not located within the known area of occupancy of either species.

While the Project will result in the removal of native vegetation and associated habitat, this is expected to be a short-term impact, as the Project includes revegetation as part of its Landscape and Urban Design Plan to ensure there is no net loss of native vegetation within the subject land. Subsequently, the Project is not considered likely to result in a significant impact to the Lord Howe Island Skink or Lord Howe Island Gecko.

FIGURES



Legend

- Subject Land
- Study Area
- Project Area
- North Zone
- South Zone

Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

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Spatial Reference: GDA 1994 MGA Zone 57

0 1 2 3 4 km

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Figure 1. Location of the Project

Image Source: ERM 2025

Figure 2. Proposed development layout within the North Zone

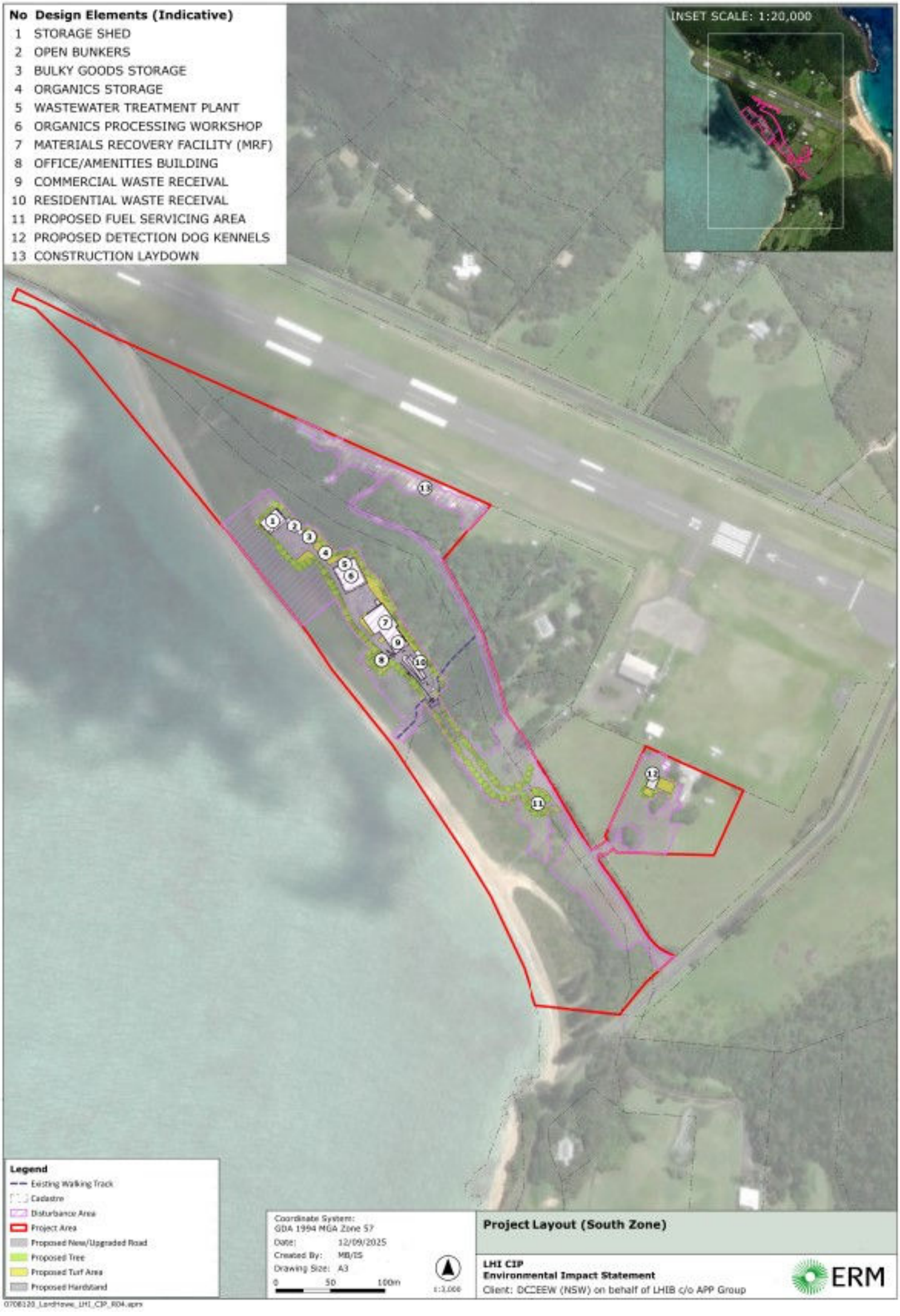

Image Source: ERM 2025

Figure 3. Proposed development layout within the South Zone

Legend

- Subject Land
- Study Area
- North Zone
- Survey Tracks
- BAM Plot Locations

Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

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Spatial Reference: GDA 1994 MGA Zone 57

0 10 20 40 60 80 m

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Figure 4. Flora survey locations within the North Zone

Legend

- Subject Land
- Study Area
- South Zone
- Survey Tracks
- BAM Plot Locations
- Rapid Data Point

Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

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Spatial Reference: GDA 1994 MGA Zone 57

0 10 20 40 60 80 m

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Figure 5. Flora survey locations within the South Zone

Figure 6. Fauna survey locations

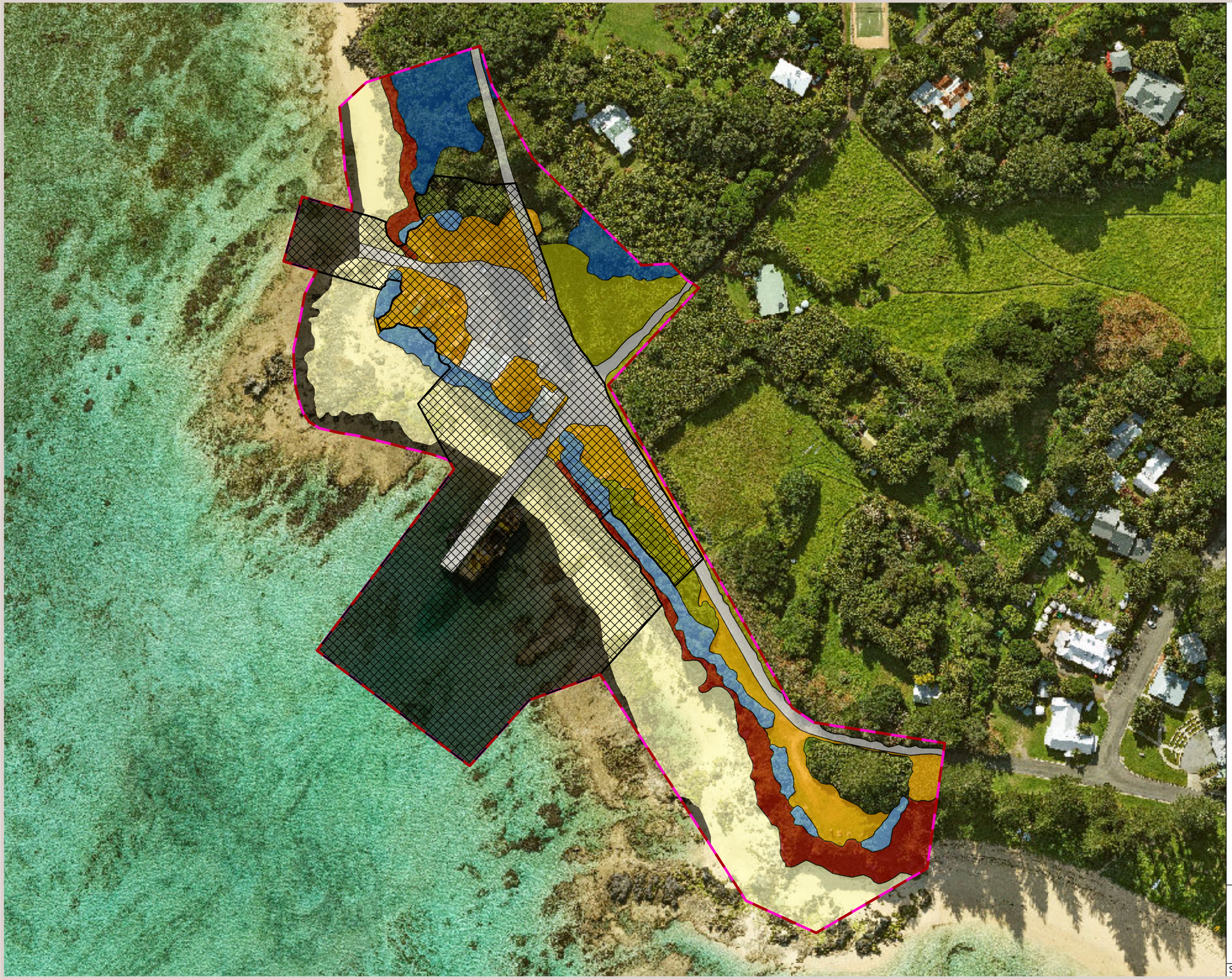
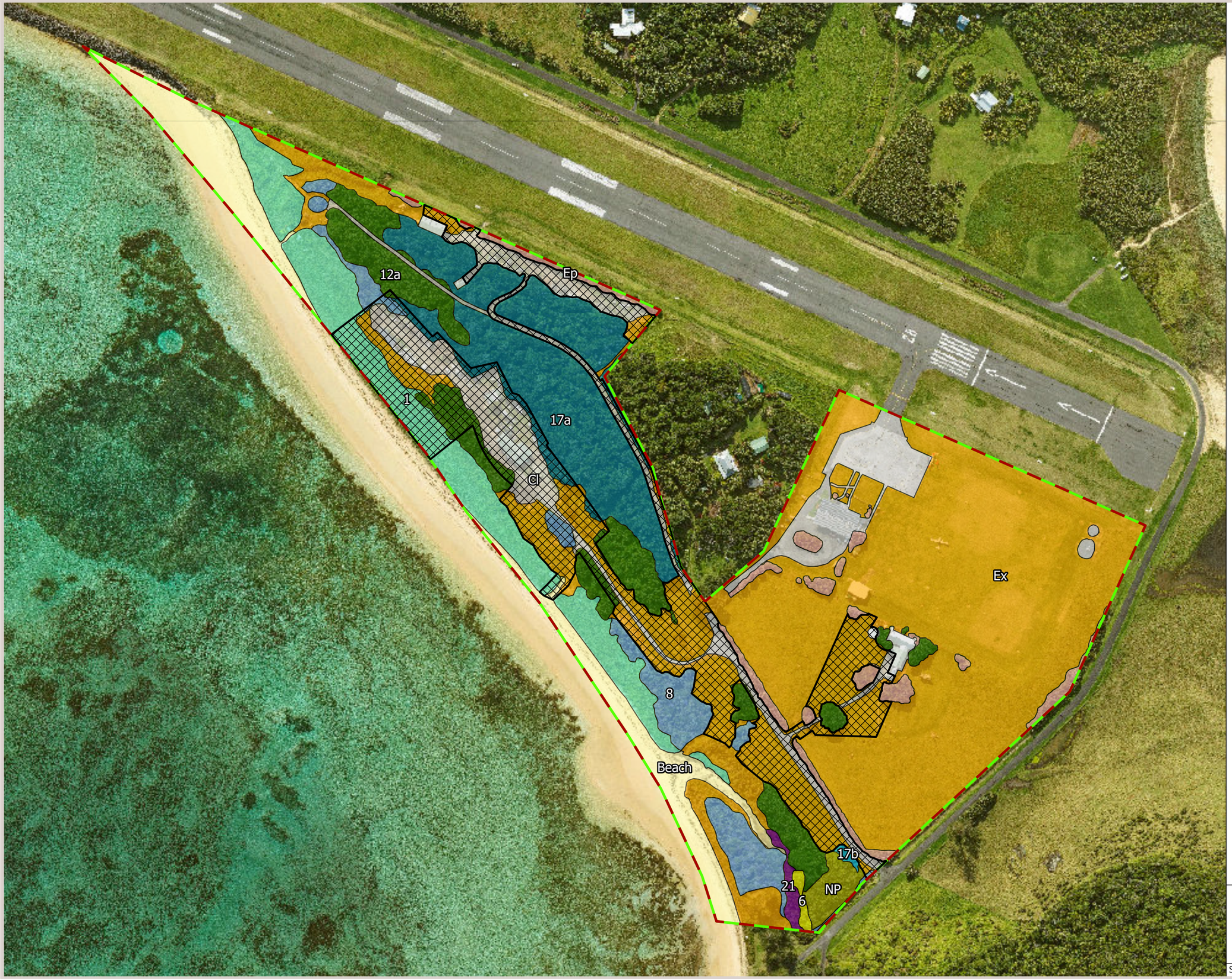


Figure 7. Vegetation communities within the North Zone



Legend

- Subject Land
- Study Area
- South Zone

Vegetation Community

- 1: Coastal Spinifex - Dune Bean - Club Rush - Melanthera biflora - Saltwater Couch beach strandline grassland
- 12a: Kentia Palm Forest on coral sand and calcarenite
- 17a: Greybark - Blackbutt rainforest
- 17b: Greybark - Blackbutt low closed forest on exposed basalt slopes
- 21: River Mangrove tall shrubland of brackish creeks
- 6: Sallywood swamp forest of poorly drained, low-lying areas
- 8: Bully Bush – Hopwood shrubland on shallow rocky soils
- NP: Plantation
- Ep: Environmental plantings
- Ex: Exotic Vegetation
- Cl: Cleared
- Beach

Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

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Spatial Reference: GDA 1994 MGA Zone 57

0 10 20 40 60 80 m

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Figure 8. Vegetation communities within the South Zone

Legend

- Subject Land
- Study Area
- South Zone
- North Zone

Threatened Ecological Community

- Lagunaria Swamp Forest on Lord Howe Island

Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

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Spatial Reference: GDA 1994 MGA Zone 57

0 75 150 300 450 600 m

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Figure 9. Threatened ecological communities within the study area

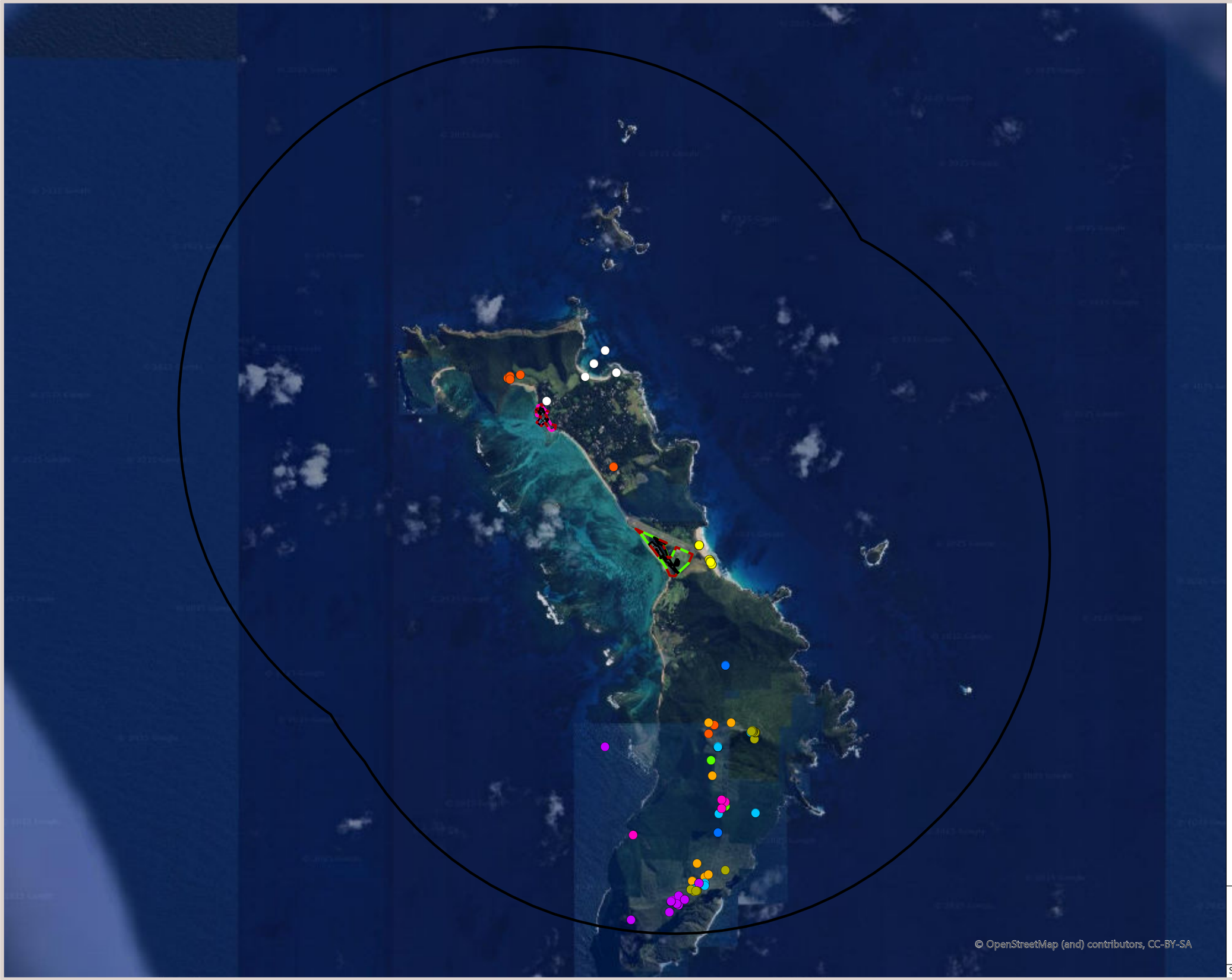
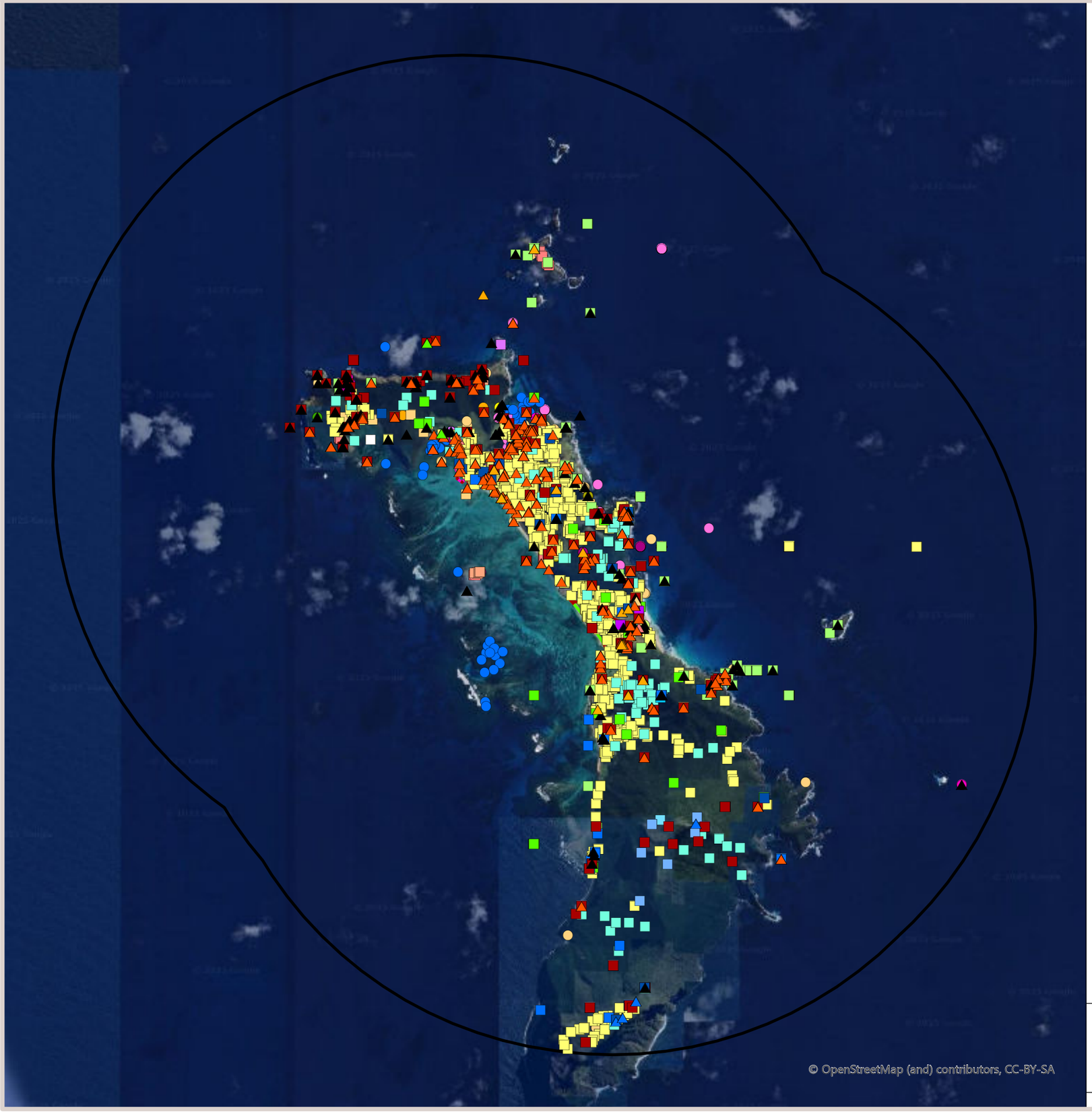


Figure 10. Threatened flora recorded within the locality

Figure 11. Threatened fauna recorded within the study area



Legend

- Study Area
- North Zone
- South Zone
- Locality (5 km)

Threatened Fauna Species

- Australasian Bittern
- Australian Painted Snipe
- Black-tailed Godwit
- Black-winged Petrel
- Common Greenshank
- Curlew Sandpiper
- Eastern Curlew
- Flesh-footed Shearwater
- Golden Whistler (Lord Howe Is. subsp.)
- Gould's Petrel
- Great Knot
- Greater Sand-plover
- Green Turtle
- Grey Ternlet
- Kermadec Petrel (west Pacific subspecies)
- Latham's Snipe
- Lesser Sand-plover
- Little Shearwater
- Little Tern
- Lord Howe Island Skink
- Lord Howe Island Southern Gecko
- Lord Howe Placostylus
- Lord Howe Woodhen
- Masked Booby
- Masked Owl
- Masters Charopid Land Snail
- Mount Lidgbird Charopid Land Snail
- New Zealand Fur-seal
- Pied Currawong (Lord Howe Is. subsp.)
- Pied Oystercatcher
- Providence Petrel
- Red Knot
- Red-tailed Tropicbird
- Silvereye (Lord Howe Is. subsp.)
- Sooty Oystercatcher
- Sooty Tern
- Terek Sandpiper
- Wandering Albatross
- White Tern
- White-bellied Storm-Petrel
- White-throated Needletail
- Whitelegge's Land Snail

Data Source: NSW BioNet Species Sightings Data Collection © State Government of NSW and NSW Department of Climate Change, Energy, the Environment and Water 2010. Dated: 29/05/2025

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Spatial Reference: GDA 1994 MGA Zone 57

0 250 500 1,000 1,500 2,000 m

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Figure 12. Threatened fauna recorded within the locality

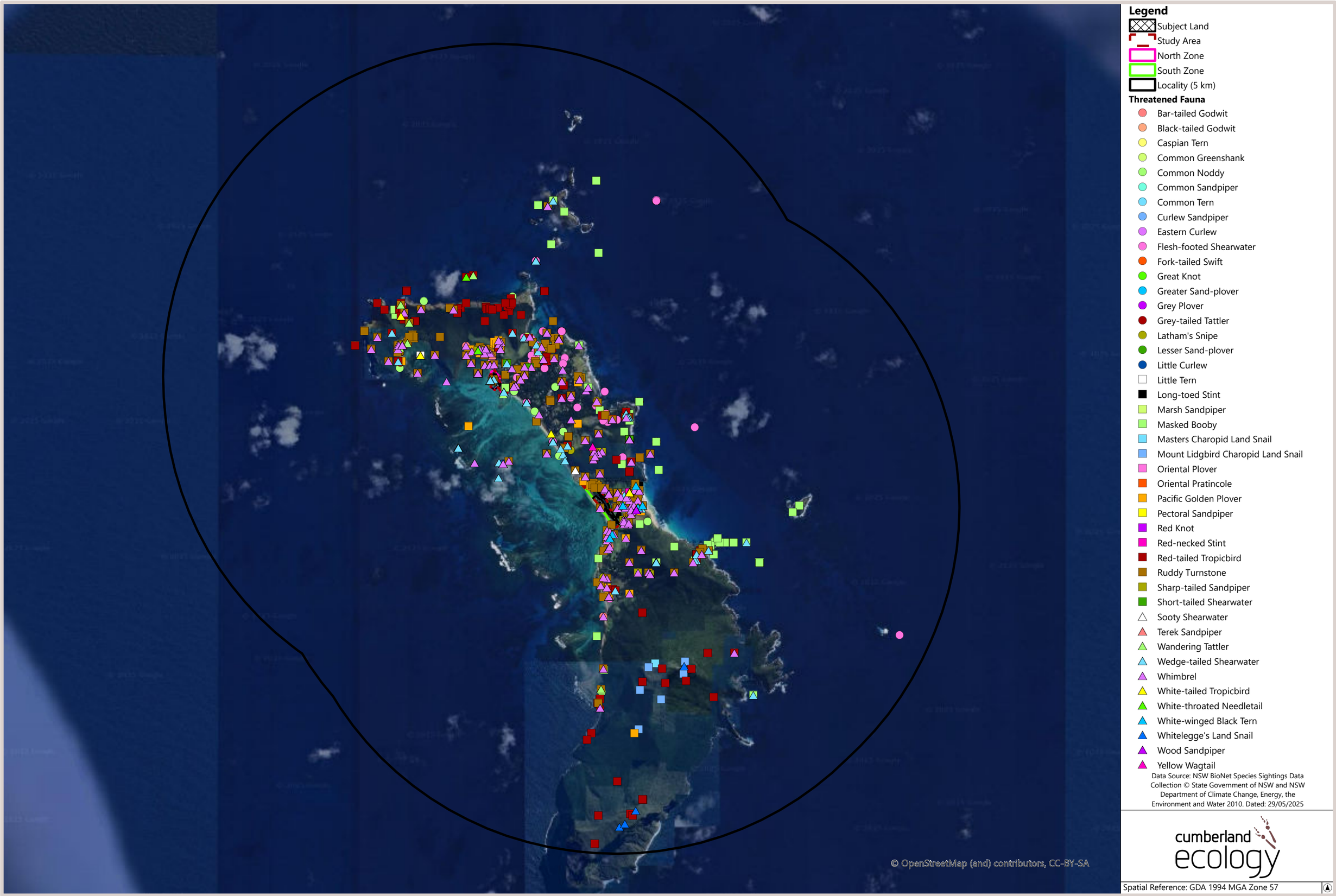

Figure 14. Migratory fauna recorded within the locality

Legend

- Subject Land
- Study Area
- North Zone

Image Source: Image © 2025 Google
Dated: August 2006
Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

cumberland ecology

Spatial Reference: GDA 1994 MGA Zone 57

0 20 40 80 120 160 m

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Figure 15. Historical imagery for the North Zone

Legend

- Subject Land
- Study Area
- North Zone
- South Zone

Image Source: Image © 2025 Google
Dated: August 2006
Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

cumberland ecology

Spatial Reference: GDA 1994 MGA Zone 57

0 20 40 80 120 160 m

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Figure 16. Historical imagery for the South Zone

Figure 17. Suitable habitat for the Sooty Tern within the study area

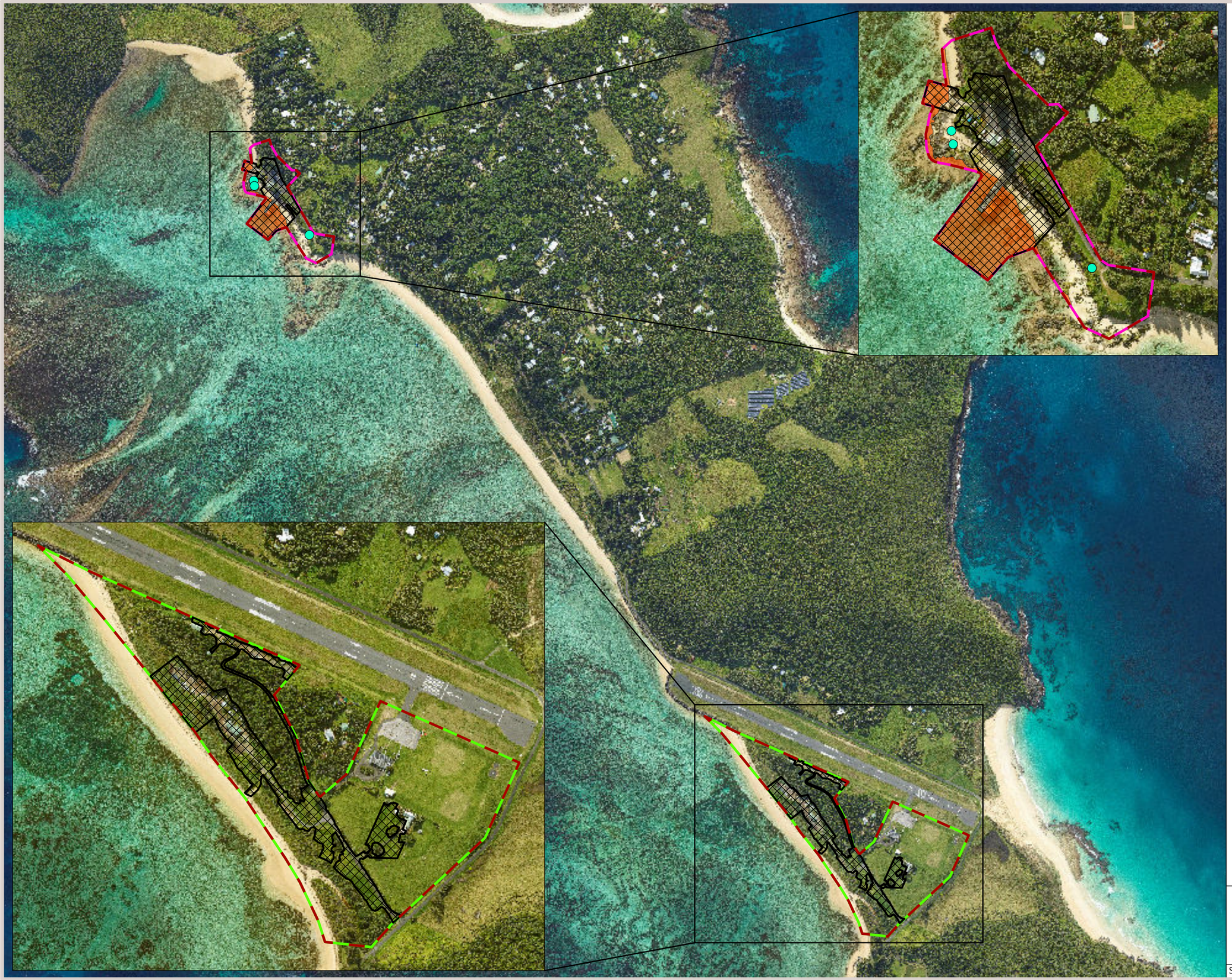

Figure 18. Suitable habitat for the Black-winged Petrel within the study area

Figure 19. Suitable habitat for the White Tern within the study area

Figure 20. Suitable habitat for the Lord Howe Woodhen within the study area

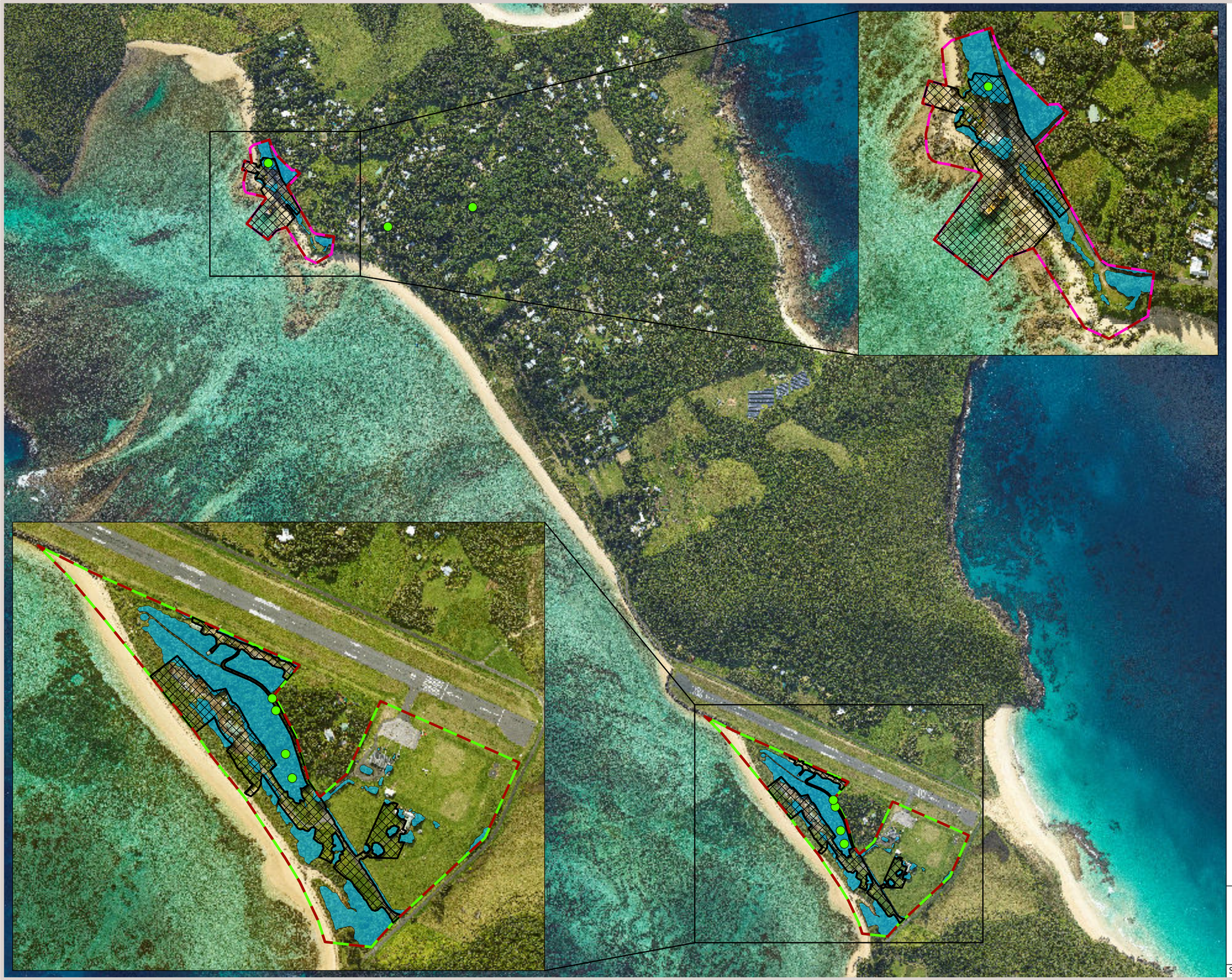

Figure 21. Suitable habitat for the Golden Whistler (Lord Howe Is. subsp.) within the study area

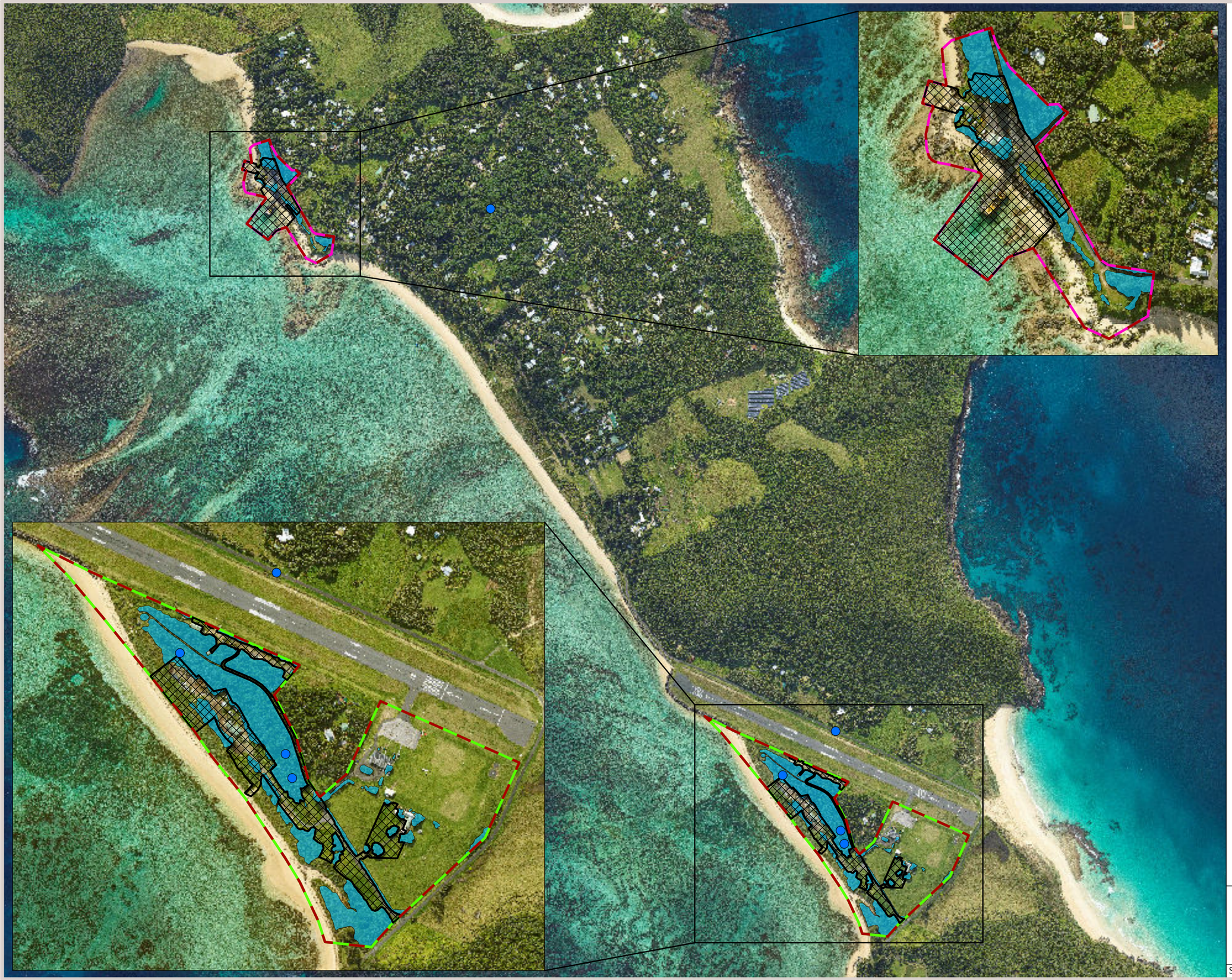

Figure 22. Suitable habitat for the Pied Currawong

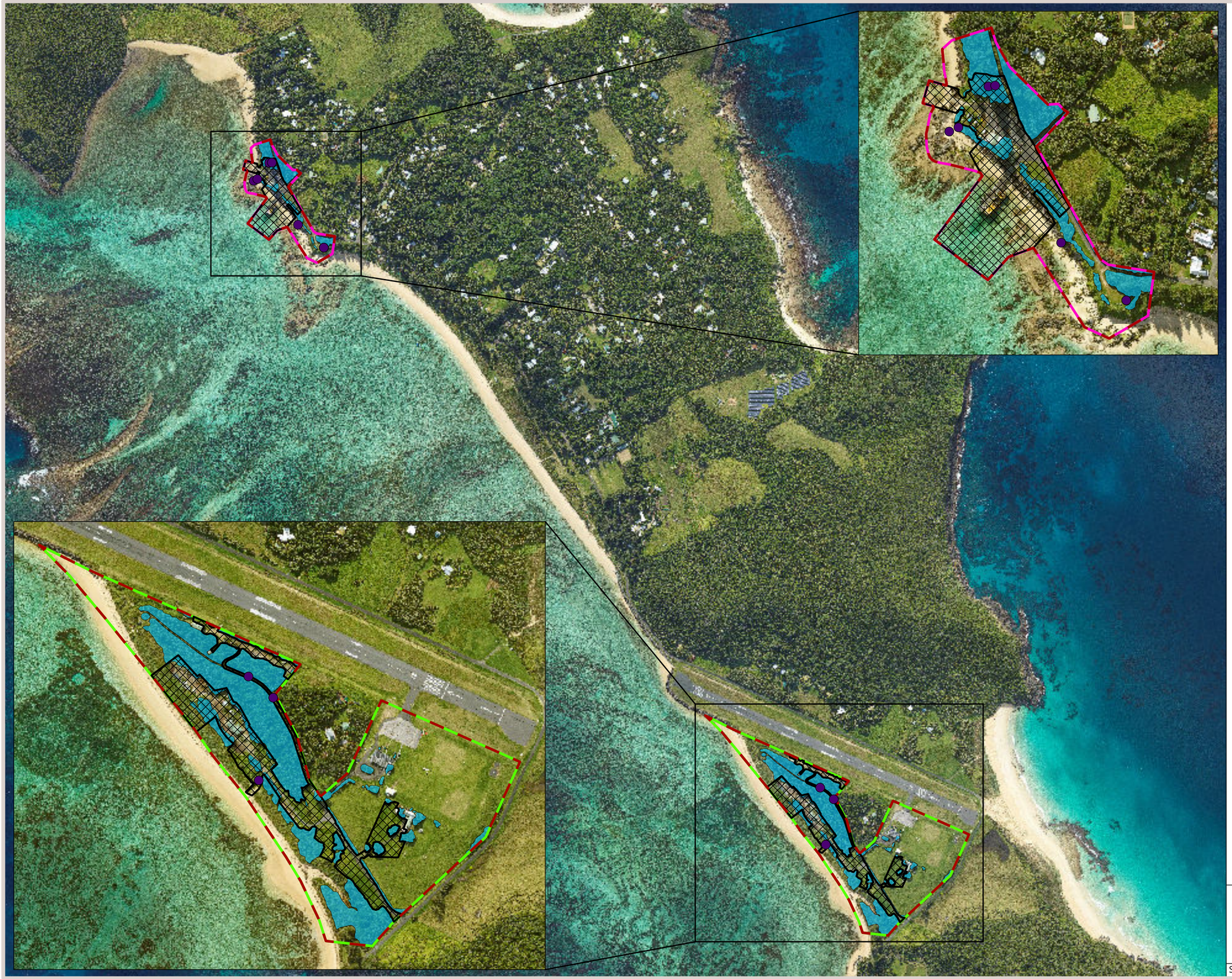

Figure 23. Suitable habitat for the Silvereye (Lord Howe Is. subsp.) within the study area

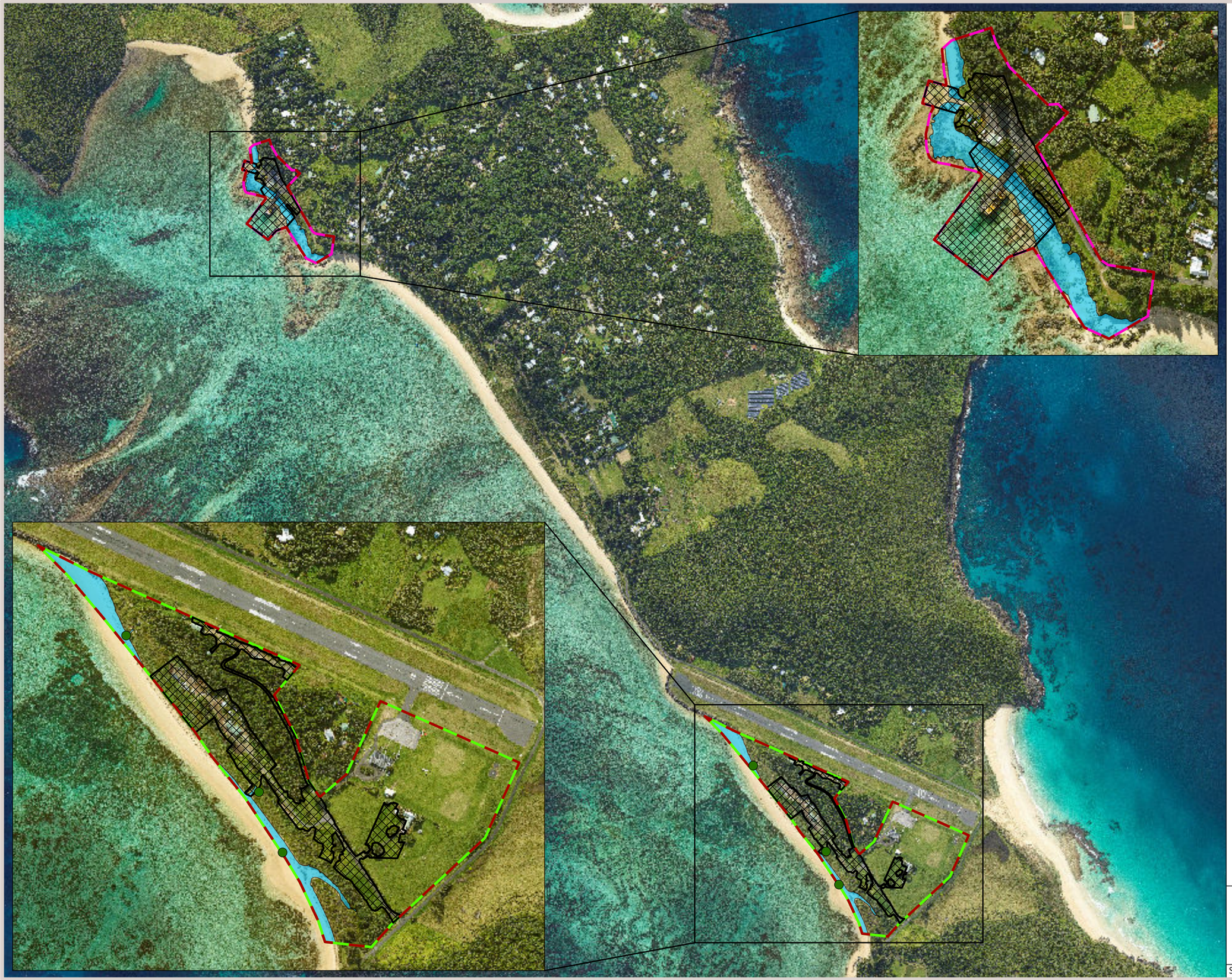

Figure 24. Suitable habitat for the Ruddy Turnstone within the study area

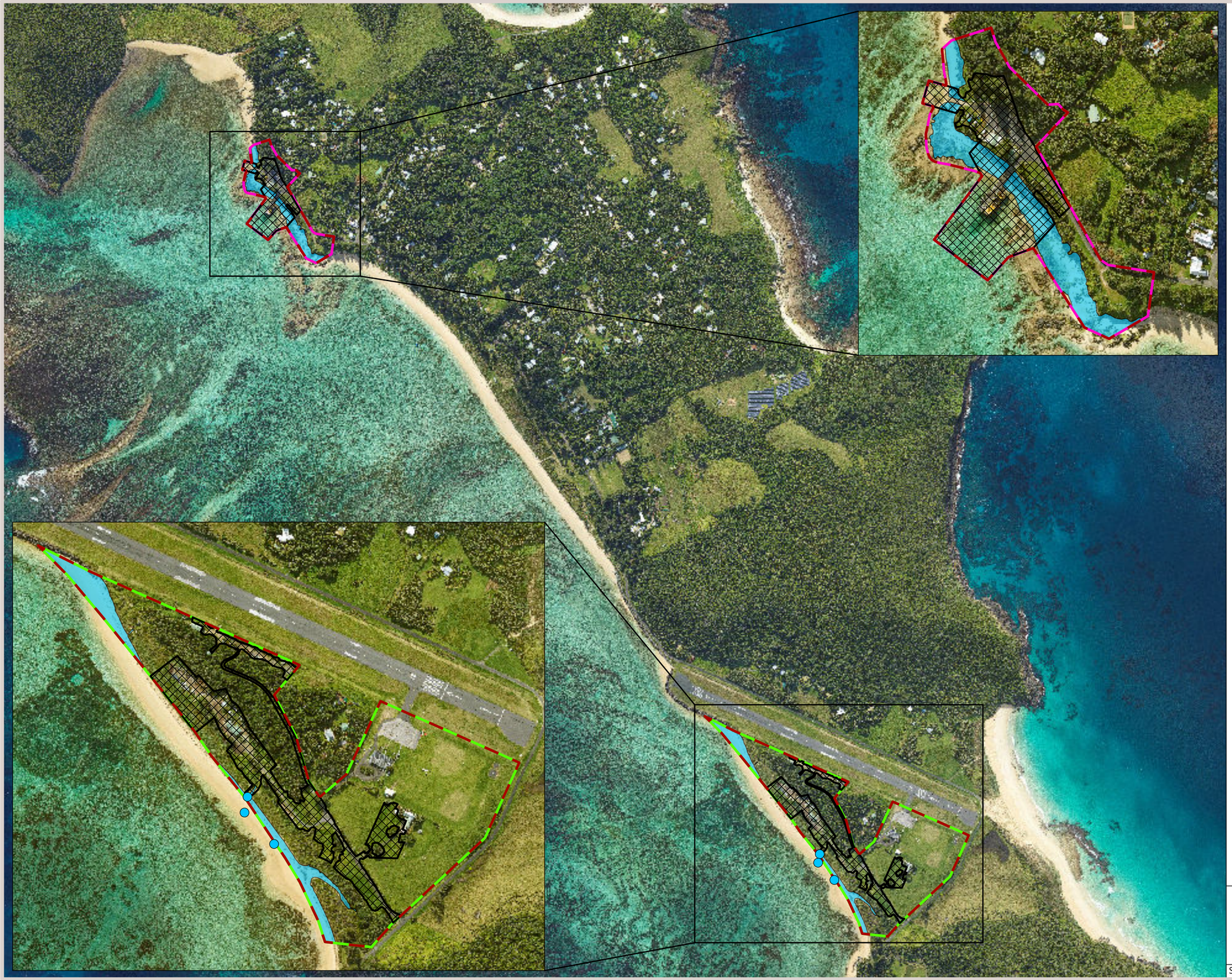

Figure 25. Suitable habitat for the Bar-tailed Godwit within the study area

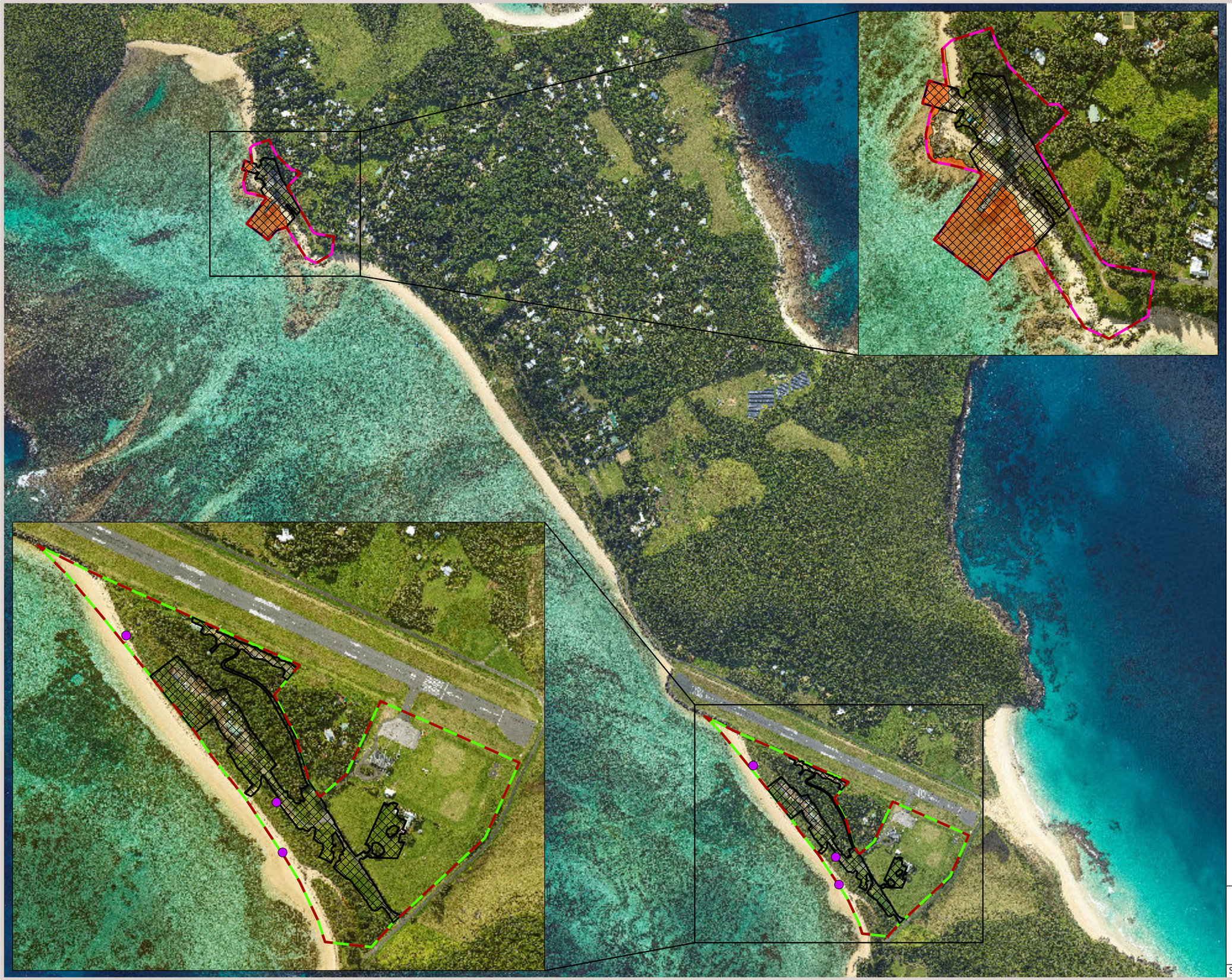

Figure 26. Suitable habitat for the Masked Booby within the study area

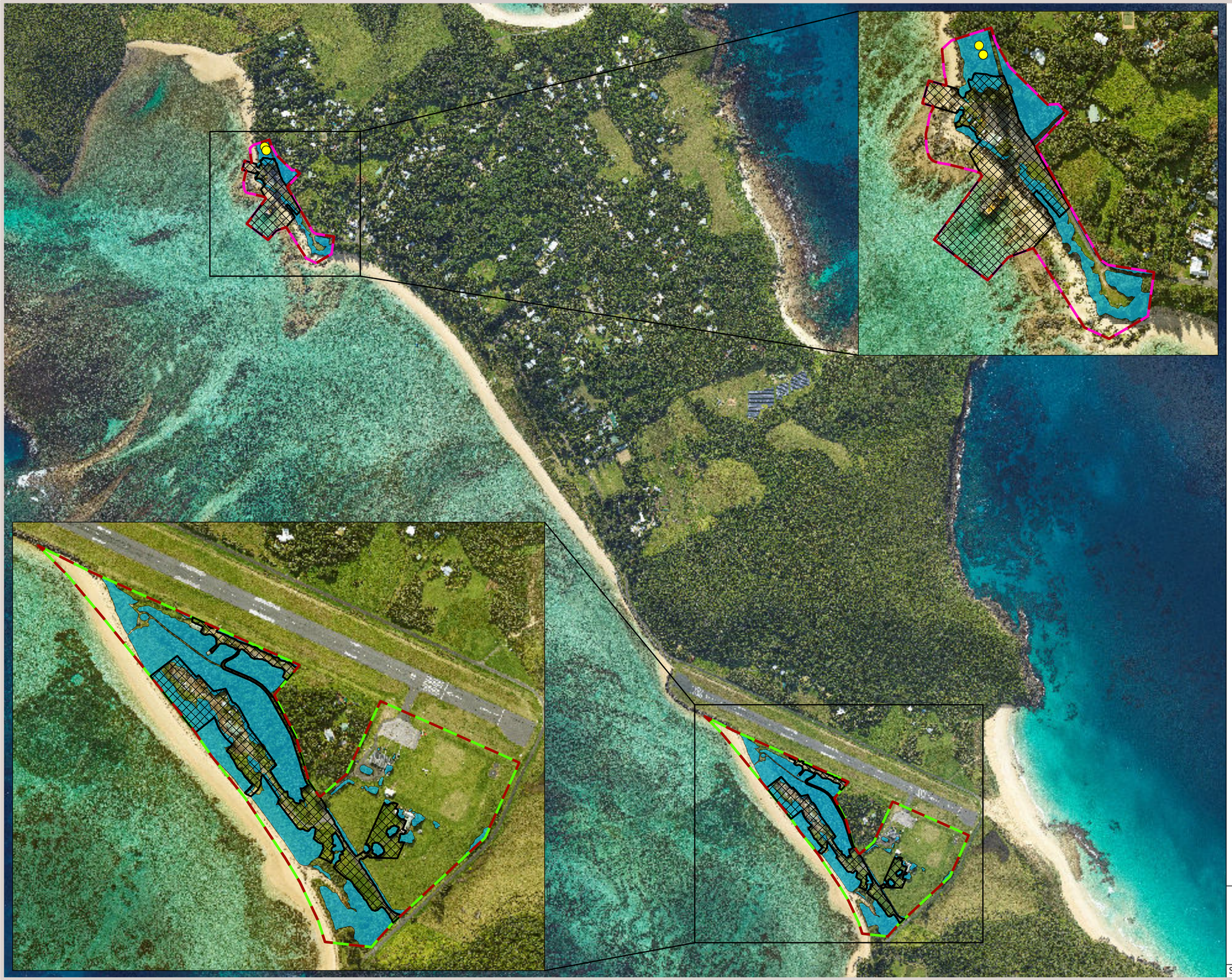

Figure 27. Suitable habitat for the Lord Howe Island Skink within the study area

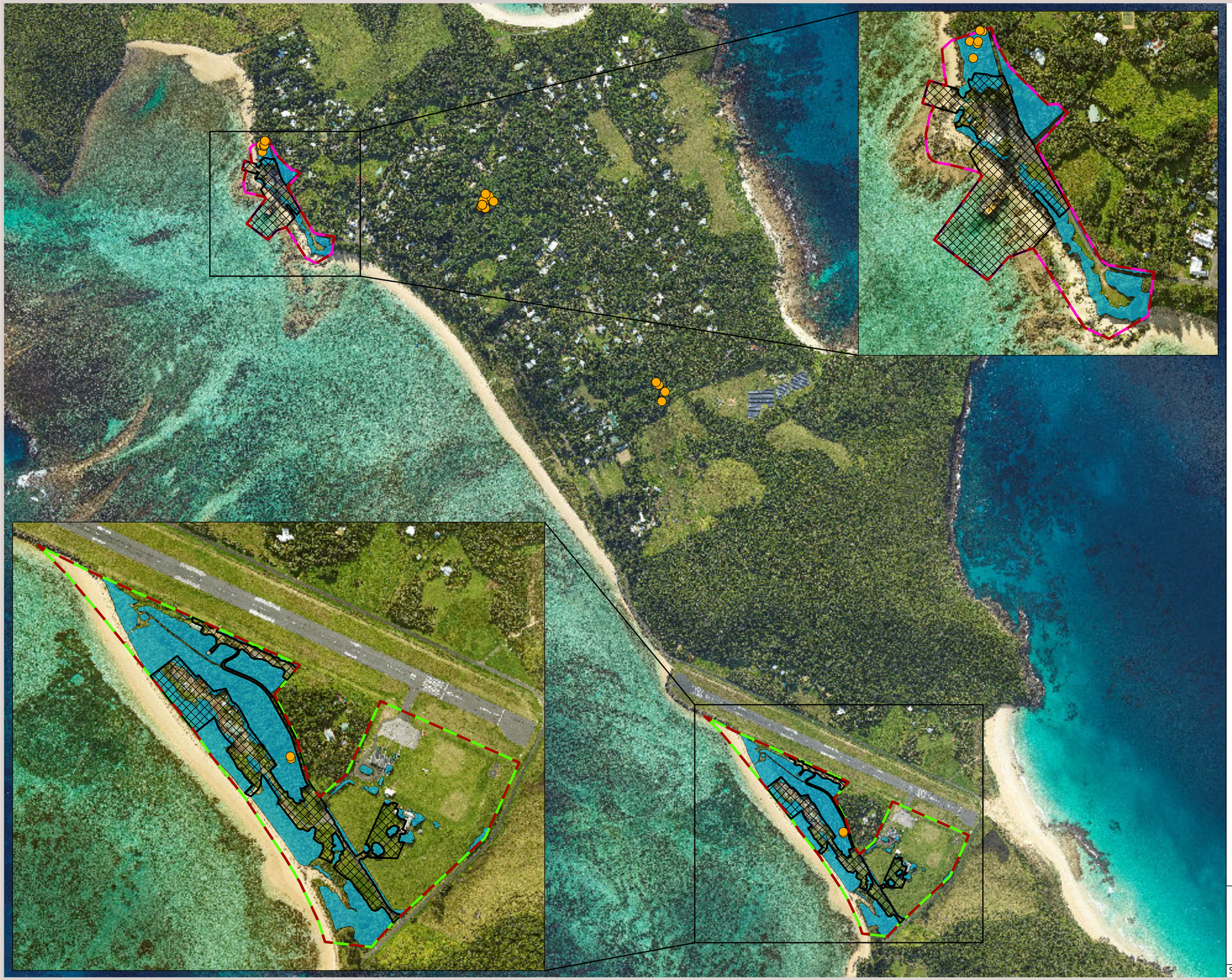

Figure 28. Suitable habitat for the Lord Howe Island Gecko within the study area

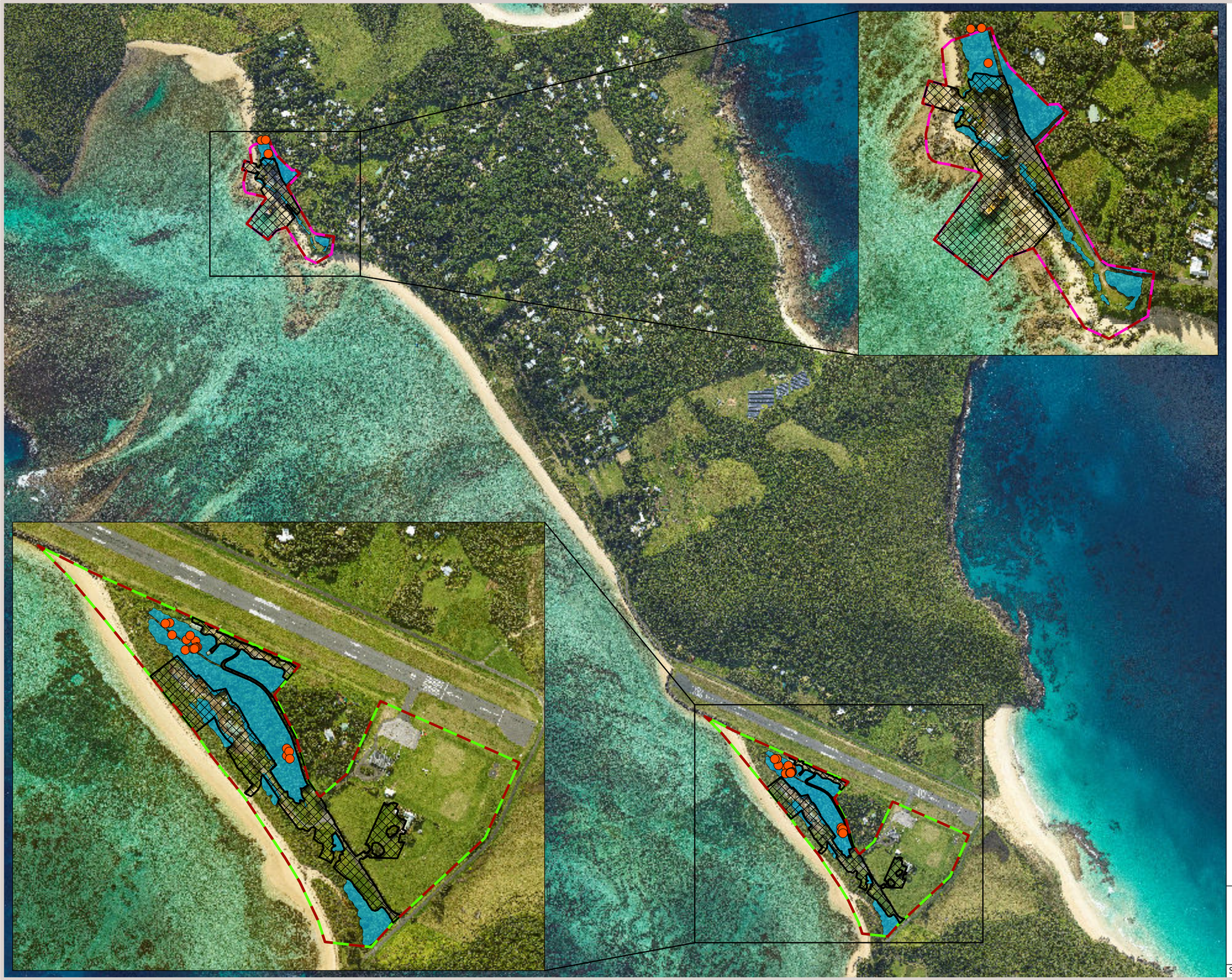

Figure 29. Suitable habitat for the Lord Howe Placostylus within the study area

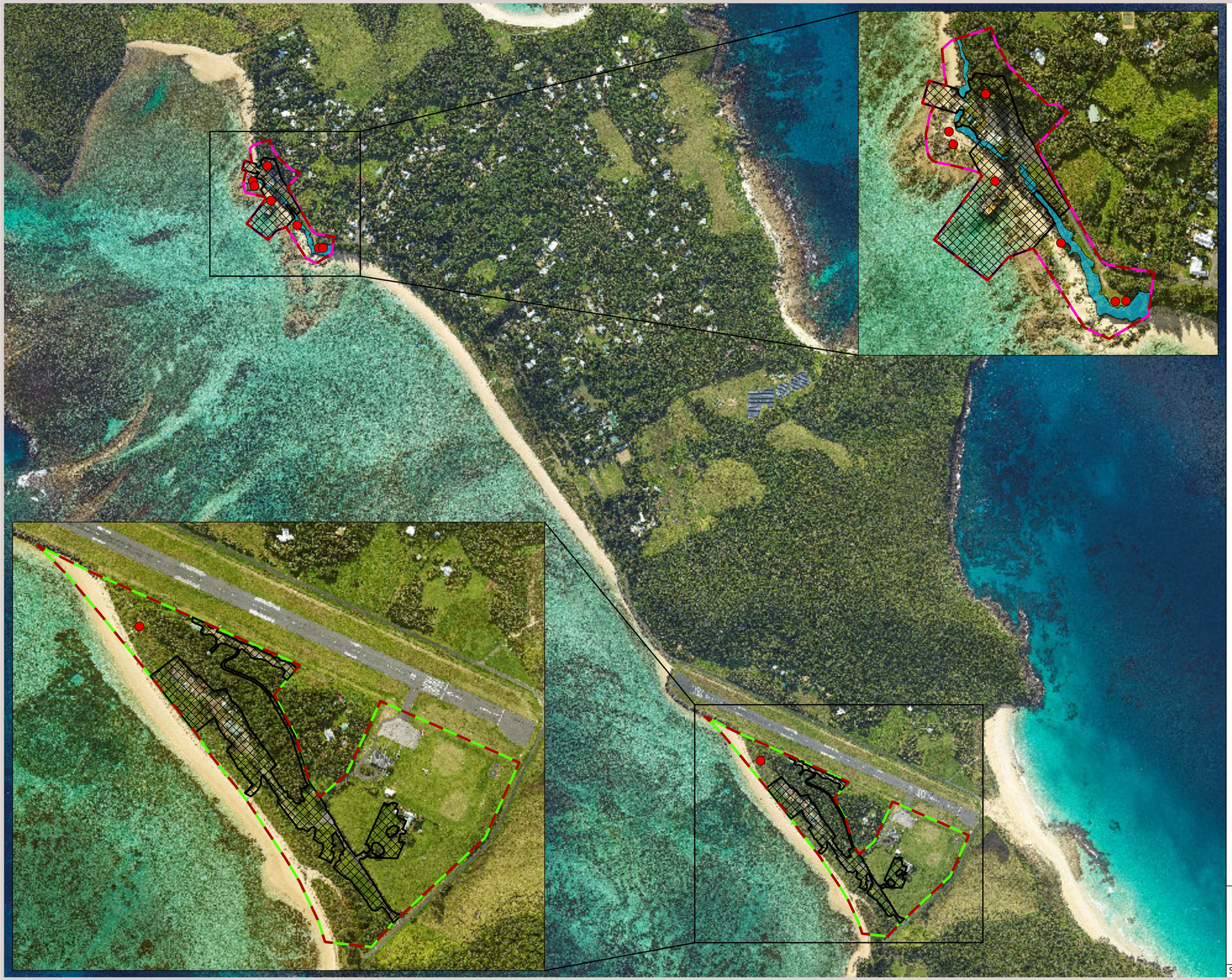

Figure 30. Suitable habitat for the Wedge-tailed Shearwater within the study area

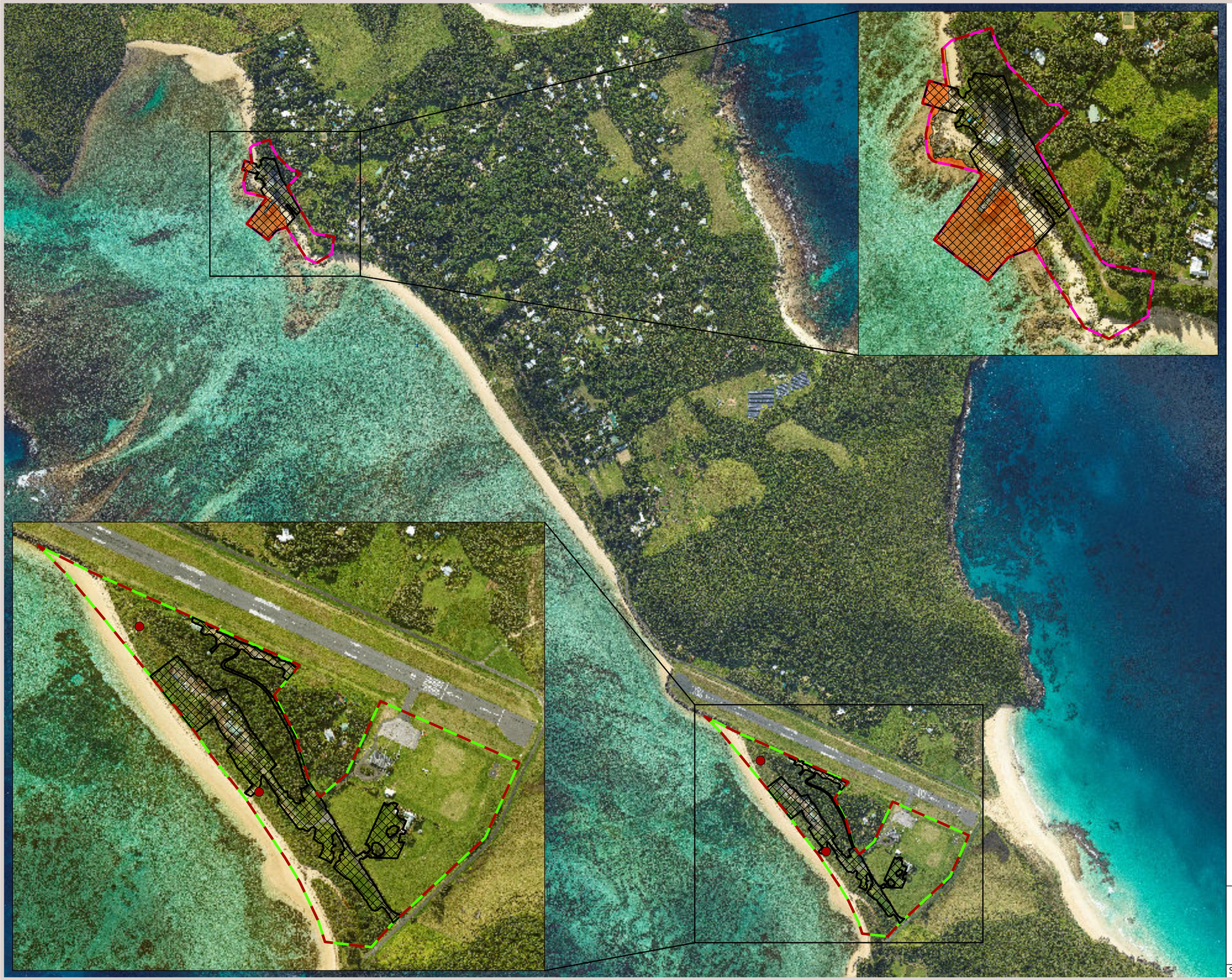

Figure 31. Suitable habitat for the Common Noddy within the study area

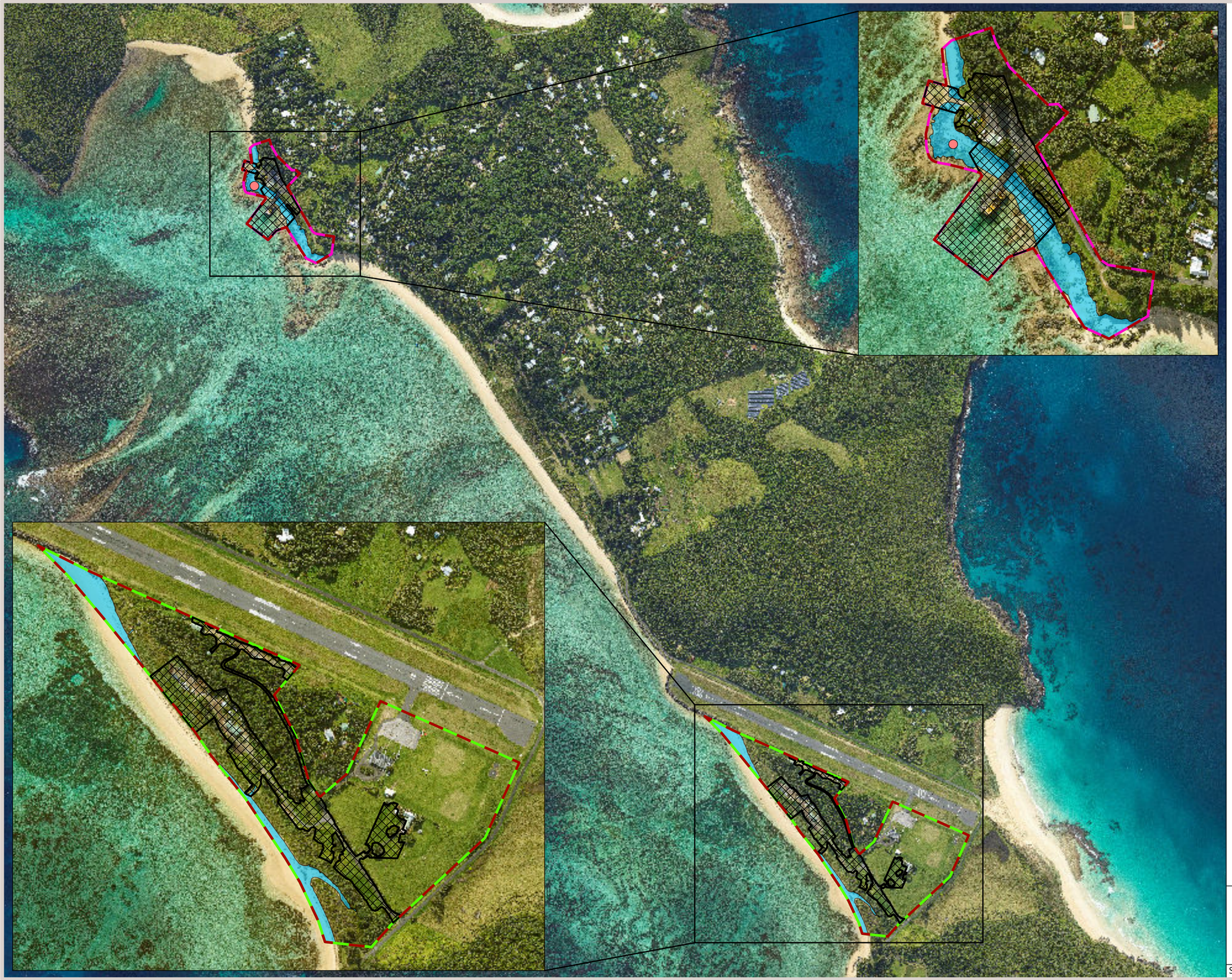

Figure 32. Suitable habitat for the Wandering Tattler within the study area

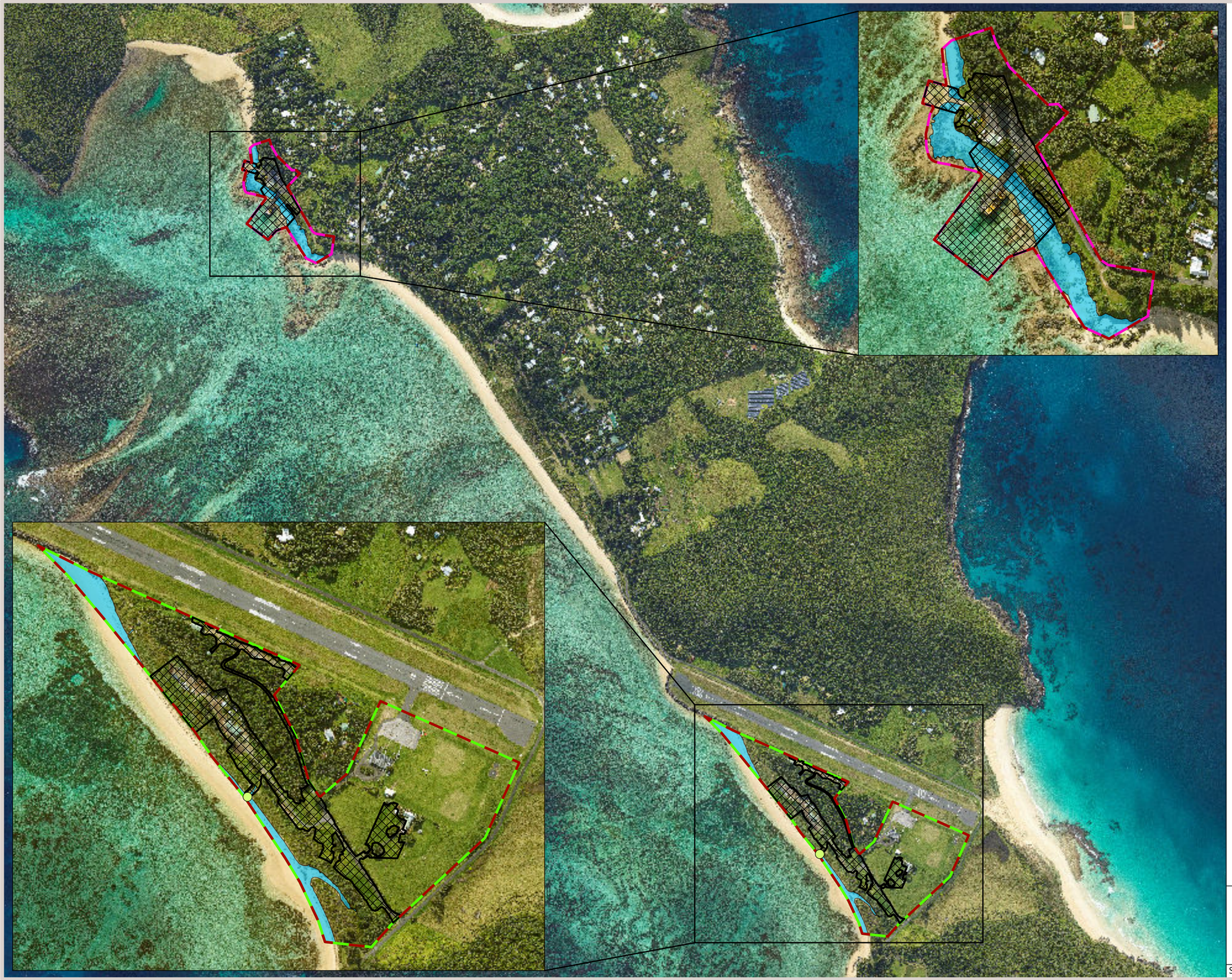

Figure 33. Suitable habitat for the Double-banded Plover within the study area

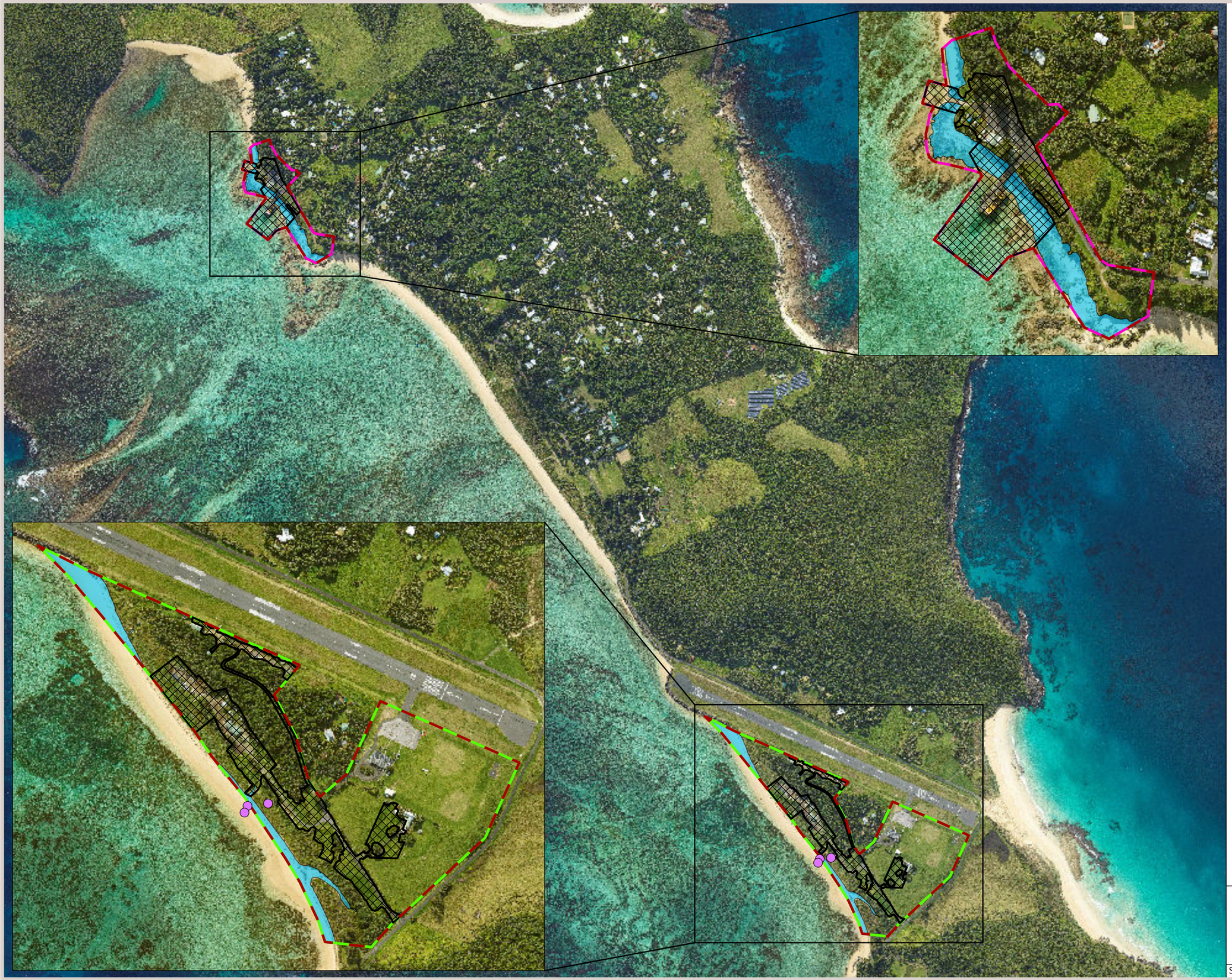

Figure 34. Suitable habitat for the Whimbrel within the study area

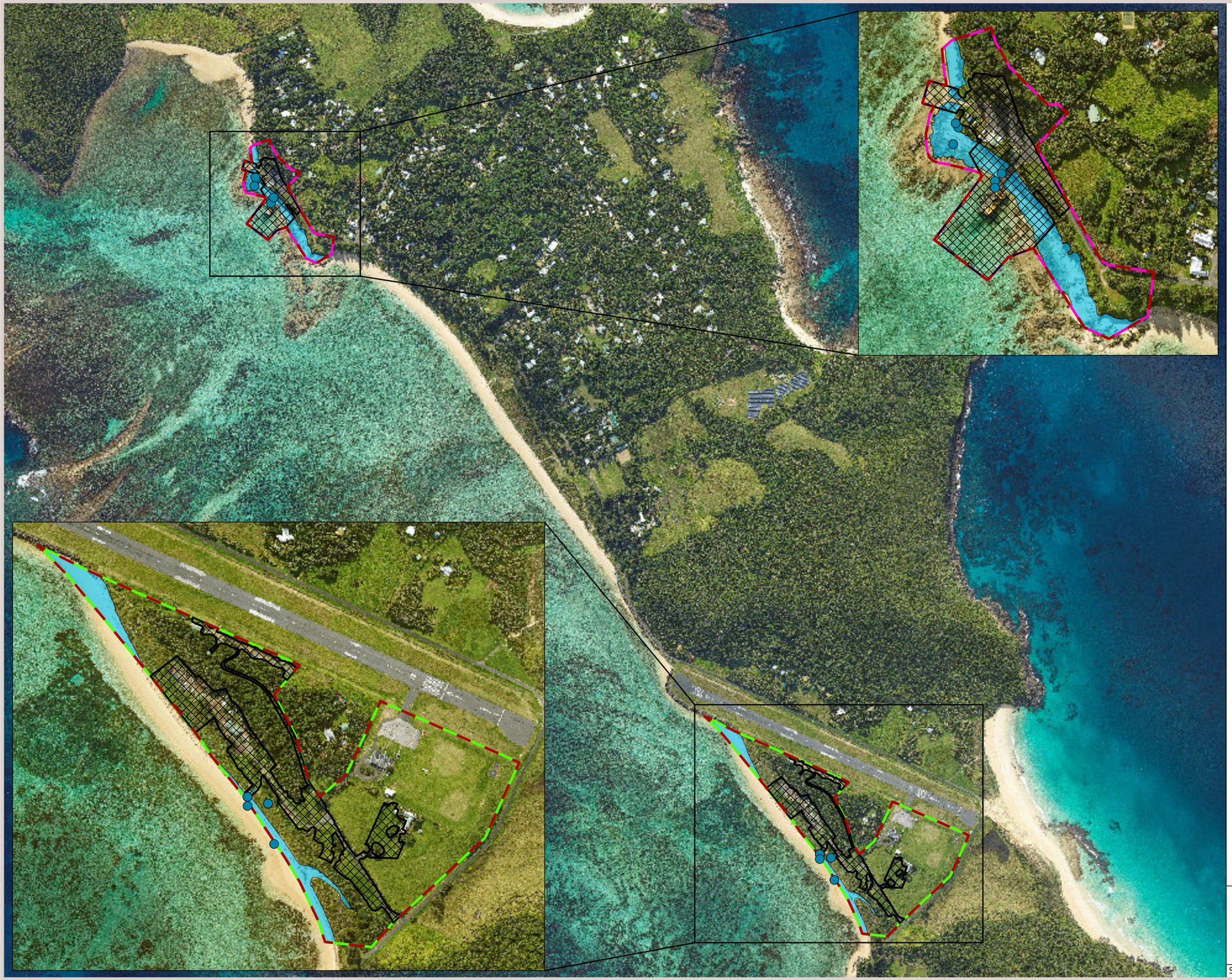

Figure 35. Suitable habitat for the Pacific Golden Plover Habitat within the study area

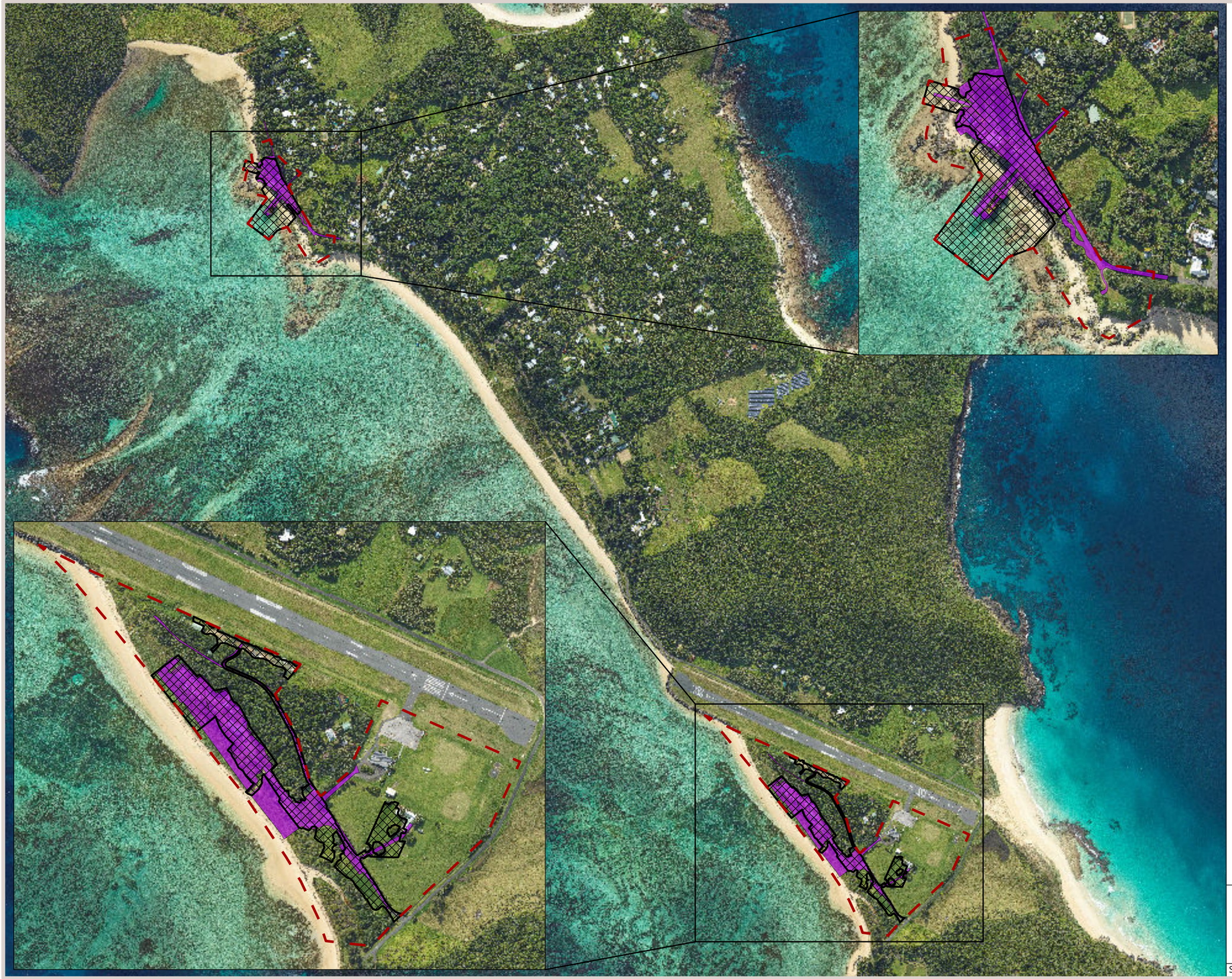

Figure 36. Comparison between the original disturbance footprint and the subject land

APPENDIX B :

Assessment of Matters of National Environmental Significance

This Appendix provides a consolidated assessment of Matters of National Environmental Significance (MNES) entities that were considered for the Project in accordance with the Referral decision. Some of this information has previously been presented in the Referral submitted to DCCEEW. However, it is reproduced here in order to present a consolidated assessment of MNES. To avoid excessive replication, sections of the BDAR are referenced where appropriate.

B.1. Identification of MNES

B.1.1. MNES considered for the Project

The MNES considered for this Project were derived from a variety of different data sources. These include:

- PMST search as conducted for the submitted Referral (conducted as a search of a 5 km radius around the subject land which encompasses most of Lord Howe Island);
- MNES entities identified by DCCEEW in the Referral decision;
- Field survey data; and
- BioNet Atlas searches conducted as part of the BDAR process (conducted as a 5 km radius around the subject land).

The PMST search conducted for the Referral is provided in **Appendix C**. It should be noted that there were no changes to listed MNES between when the PMST search was completed and the referral decision was made. A likelihood of occurrence assessment was undertaken for BC Act and EPBC Act listed entities for the Project and is included within the FFA in **Appendix A**. This includes all MNES entities listed in the likelihood of occurrence assessment that was submitted with the Referral. The list of threatened and migratory species listed in the Referral decision is summarised in **Table 16** below. Further assessment of the impacts of the Project on the threatened and migratory species listed in **Table 16** is provided in subsequent sections.

Table 16 MNES entities considered for the Project

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	Information source for Occurrence	Likelihood of Occurrence (see Appendix A)	Entity included in Referral
World Heritage Properties/National Heritage Places					
Lord Howe Island Group	Lord Howe Island Group	Declared Property/ Natural Heritage	PMST, Referral decision	Known	Yes
Threatened and Migratory Fauna					
Hypotaenidia sylvestris	Lord Howe Woodhen	E	PMST, Referral decision	Known	Yes
Strepera graculina crissalis	Lord Howe Island Pied Currawong	V	PMST, Referral decision	Known	Yes
Arenaria interpres	Ruddy Turnstone	V, M	PMST	High	Yes
Calidris ferruginea	Curlew Sandpiper	CE, M	PMST	High	Yes
Christinus guentheri	Lord Howe Island Gecko	V	PMST, Referral decision	High	Yes
Limosa lapponica baueri	Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit	E, M	PMST, Referral decision	High	Yes
Oligosoma lichenigerum	Lord Howe Island Skink	V	PMST, Referral decision	High	Yes
Placostylus bivaricosus	Lord Howe Flax Snail	E	PMST, Referral decision	High	Yes
Calidris acuminata	Sharp-tailed Sandpiper	V, M	PMST	Moderate	Yes
Calidris canutus	Red Knot	V, M	PMST	Moderate	Yes
Fregetta grallaria	White-bellied Storm-Petrel	V	PMST	Moderate	Yes
Gallinago hardwickii	Latham's Snipe	V, M	PMST	Moderate	Yes

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	Information source for Occurrence	Likelihood of Occurrence (see Appendix A)	Entity included in Referral
Numenius madagascariensis	Eastern Curlew	CE, M	PMST	Moderate	Yes
Tringa nebularia	Common Greenshank	E, M	PMST	Moderate	Yes
Migratory (only) Fauna					
Ardenna pacifica	Wedge-tailed Shearwater	M	PMST, Referral decision	Known	Yes
Anous stolidus	Common Noddy	M	PMST	High	Yes
Ardenna carneipes	Flesh-footed Shearwater	M	PMST	High	Yes
Calidris ruficollis	Red-necked Stint	M	PMST	High	Yes
Charadrius bicinctus	Double-banded Plover	M	Recorded during surveys	High	No
Numenius phaeopus	Whimbrel	M	PMST	High	Yes
Pluvialis fulva	Pacific Golden Plover	M	PMST	High	Yes
Sula dactylatra	Masked Booby	M	PMST	High	Yes
Tringa incana	Wandering Tattler	M	PMST	High	Yes
Xenus cinereus	Terek Sandpiper	M	PMST	High	Yes
Calidris melanotos	Pectoral Sandpiper	M	PMST	Moderate	Yes
Charadrius veredus	Oriental Plover	M	PMST	Moderate	Yes
Chlidonias leucopterus	White-winged Black Tern	M	PMST	Moderate	Yes
Hydroprogne caspia	Caspian Tern	M	PMST	Moderate	Yes
Numenius minutus	Little Curlew	M	PMST	Moderate	Yes
Tringa brevipes	Grey-tailed Tattler	M	PMST	Moderate	Yes

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	Information source for Occurrence	Likelihood of Occurrence (see Appendix A)	Entity included in Referral
Tringa stagnatilis	Marsh Sandpiper	M	PMST	Moderate	Yes
Xenus cinereus	Terek Sandpiper	M	PMST	Moderate	Yes

V=*Vulnerable, E=Endangered, CE=Critically Endangered, M=Migratory*

B.2. World Heritage Properties and National Heritage Places

The Lord Howe Island Group was listed as a UNESCO World Heritage Property in 1982 for its outstanding natural heritage significance and was subsequently included on the Australian National Heritage List in 2007 (Place ID 105694). National Heritage Places, like World Heritage Properties in Australia, are protected under the *Environment Protection and Biodiversity* Conservation Act 1999 (Cth) (EPBC Act). A Statement of Heritage Impact has been prepared for the Project by ERM (ERM, 2025), which provides an assessment of the Project against the World and National Heritage values. This assessment concluded that the Project will not result in the identified World Heritage or National Heritage values of the Lord Howe Island Group being lost, degraded or damaged or notably altered, modified, obscured or diminished and therefore, would not have a significant impact to World Heritage or National Heritage values.

B.3. Threatened and Migratory Fauna

As identified in **Table 16**, 32 species listed as threatened and/or migratory species listed as MNES under the EPBC Act have been identified for further assessment. This includes 31 species identified in the PMST which were included in the EBPC Referral, as well as one additional species identified during field surveys. Of the species identified in the PMST, six threatened species and one migratory species were identified in the Referral decision as species that are likely or have potential to be significantly impacted by the Project.

Further details on the survey methodology, occurrence of threatened and migratory species and an assessment of the impacts of the Project on known and potentially occurring threatened and migratory species is provided in **Chapter 3**, **Chapter 6** and **Chapter 9**.

The Significant Impact Criteria provided in the 'Matters of National Environmental Significance: Significant impact guidelines 1.1 *Environment Protection and Biodiversity Conservation Act 1999*' (DotE, 2013) have been applied to all MNES identified within the Referral decision and are provided in ***Section B.3.1*** below.

B.3.1. Critically Endangered or Endangered Species

The following species listed as critically endangered or endangered under the EPBC Act have been assessed below.

- Lord Howe Woodhen (known to occur);
- Lord Howe Placostylus (potential to occur); and
- Bar-tailed Godwit (potential to occur).

The Lord Howe Woodhen has been recorded from the subject land and is known to occur in areas of palm dominated lowland closed forest as well as grasslands derived from clearing and gardens. This habitat occurs across the subject land and wider study area and is considered to provide foraging and roosting habitat for the species. Since the eradication of the invasive Black Rat on Lord Howe Island, this species has become highly abundant across the Island, with 5,846 records within a 5km locality of the subject land.

The Lord Howe Placostylus has been recorded from the study area and while there have not been records within the subject land, suitable habitat is available in damp shaded locations provided by closed canopy vegetation. This habitat occurs across within the subject land and is considered to provide foraging and breeding habitat for the species.

The Bar-tailed Godwit has not previously been recorded within the subject land. Fifteen previous records of the Bar-tailed Godwit are held within the NSW BioNet Atlas that are located within the South Zone. Furthermore, 321 records of the Bar-tailed Godwit occur within a 5km locality of the subject land. This species has been assessed as having the potential to occur in within the subject land due to its ability to utilise potential habitat, albeit limited, including sandy beaches, exotic grasslands derived from clearing and rock platforms for foraging and roosting. Areas comprising suitable habitat within the subject land are limited to a few small sections of sandy beaches and rock platforms. These habitats within the subject land are periodically inundated with water as a result of the changing tides and therefore are considered temporary roosting/foraging habitats only.

An assessment against the EPBC Significant Impact Criteria for these two species is provided in **Table 17**.

Table 17 Significant Impact Criteria for Critically Endangered or Endangered Species

Significant Impact Criteria	Response
Will the action lead to a long-term decrease in the size of a population	The Lord Howe Woodhen was recorded on 17 occasions during targeted bird surveys within the subject land. The species is highly abundant within the subject land and given the high frequency of encounters, not all encounters were recorded. The NSW BioNet holds a further 5,846 records of the species within the locality. Since the eradication of the invasive Black Rat on Lord Howe Island, this species has become highly abundant across the Island, and is regularly observed foraging and roosting in modified or urban habitats like sporting fields, garden beds and golf courses. Given the high number of individuals throughout the Island, the modification is not considered likely to lead to a long-term decrease in the size of a population for this species. There were 41 records of the Lord Howe Placostylus recorded during targeted spotlighting surveys within the study area immediately adjoining vegetation in July and December 2024 and February 2025. The species has not been recorded within the subject land. This species is predominantly recorded in the South Zone in vegetation adjoining the Waste Facility, both within the subject land and wider study area. Within the North Zone, the species has only been recorded in vegetation between the boat ramp and Old Settlement Beach outside of the subject land. The species was identified within the same few locations

Significant Impact Criteria	Response
	across multiple survey periods and despite thorough searches in surrounding areas, the area of occupancy did not increase. Within the South Zone, records within the study area included individual snails that were identified along the existing access road north of the T-junction. The subject land is located outside of the species known area of occupancy. A small area of potential habitat will be removed from the subject land to facilitate the Project; however this habitat is located beyond the species known area of occupancy. Furthermore, habitat around the perimeter of the existing waste facility that is subject to the proposed action comprise more degraded areas of habitat due to edge effects. These areas were found to have shallow litter cover, while rubbish and exotic grasses and weeds were also present. These areas are considered less suitable for the species. There are large areas habitat to be retained within the study area, both within the North Zone and South Zone, which have large quantities of old, empty Lord Howe Placostylus shells, suggesting these areas comprise suitable habitat and would have been occupied by the species prior to the invasion of black rat. Therefore, large areas of suitable habitat will be retained within the study area. Mitigation measures, including pre-clearance surveys will be undertaken within the subject land prior to the commencement of vegetation clearing. This will involve racking of leaf litter and collection of any live individuals (if encountered) for translocation into nearby retained vegetation. Given the areas of suitable habitat to be removed by the proposed action are only small, pre-clearance surveys can effectively be undertaken to minimise impacts on the species. Furthermore, following the eradication of black rats, it is expected that the abundance and distribution of the Lord Howe Placostylus will continue to grow. With the implementation of mitigation measures, and given the large areas of suitable habitat retained within the study area, the Project is not considered likely to lead to a long decrease in the size of a population for this species. The Bar-tailed Godwit was recorded within the study area during targeted field surveys however was not identified within the subject land. Records of the species within the study area were of up to three individuals foraging around

Significant Impact Criteria	Response
	the estuary of Cobbys Creek. As this species is highly mobile, this species could potentially utilise sandy beaches, grasslands and rock platform habitats within the subject land as part of their broader range. The sandy beaches and rock platforms are frequently inundated with tidal changes and therefore are considered temporary habitat for the species. Given the small area and fluctuation of available habitat, the Project is not considered likely to lead to a long-term decrease in the size of a population of this species.
Will the action reduce the area of occupancy of the species	Only the Lord Howe Woodhen has been recorded from the subject land. The removal of habitat within the subject land will reduce the area of occupancy for the Lord Howe Island Woodhen, however, will not reduce the area of occupancy for the Lord Howe Placostylus or Bar-tailed Godwit.
Will the action fragment an existing population into two or more populations	The Lord Howe Woodhen is a highly mobile species that forages over large areas and removal of a small portion of potential habitat is unlikely to fragment existing populations. The species is regularly encountered within urban areas, around houses, on roadways and at the airport. The Lord Howe Placostylus is not highly mobile however the species has not been recorded within the subject land. As such, the Project is not likely to fragment existing populations of the species. The Bar-tailed Godwit is a highly mobile species that forages over large areas. The removal of a small portion of potential habitat is unlikely to fragment existing populations of this species.
Will the action adversely affect habitat critical to the survival of a species	The Lord Howe Woodhen has been recorded within the subject land and wider locality. The Recovery Plan for the Lord Howe Woodhen identifies all habitat known to be used by the species as critical habitat to the survival of the species. This includes the three predominant vegetation types that the species is associated with, including: • Gnarled Mossy-Forest; • Megaphyllous Broad Sclerophyll Forest; and • Gardens around houses. In addition to these broad vegetation types, other habitat types where the species has been seen which are considered to be critical habitat include: • Forest bordering pasture and gardens;

Significant Impact Criteria	Response
	• Pasture and reedy swamp; and • Rubbish dump (prior to the upgrade of the disposal facility) The Recovery Plan for the Lord Howe Woodhen was published in 2002, when the species was in rapid rates of decline. Today, following the success of captive breeding programs and the eradication of the Black Rat, the species is in high abundance, having been recorded within all vegetation types within the subject land and wider study area. Given the current abundance and distribution of the species, the habitat within the subject land is not considered to be critical to the survival of the species, as large areas of suitable habitat will be retained in the wider study area. Furthermore, areas of native vegetation across the island provide suitable habitat for the species which is also protected. As such the removal of a small area of habitat for the species within the subject land is not considered to adversely affect critical habitat for the survival of the species. Habitat critical to the survival of the Lord Howe Placostylus has not been identified in any conservation advice or recovery plan. Nevertheless, suitable habitat, in the form of damp shaded locations provided by closed canopy vegetation, is known to be favoured habitat for the species and is available within the subject land, study area and wider assessment area. Surveys were undertaken in accessible areas around the island and although no live individuals were identified, all areas contained an abundance of old, empty snail shells. As such it is likely that prior to the invasion of the Black Rat, these areas provided suitable habitat for the species. The proposed action will not remove any habitat within the known area of occupancy of the species and given the large areas of suitable habitat available within the study area and wider assessment area, the removal of a small area of potential habitat is not likely to adversely affect habitat critical to the survival of this species. The Bar-tailed Godwit, has not previously been recorded from the subject land, although has been assessed as having some potential to occur due to records of the species close by in the study area and wider locality. Because of the small area of marginal habitat available, the low number of records and a known population has not been recorded, suggesting that the species does not rely

Significant Impact Criteria	Response
	on the habitat for foraging, breeding, roosting or dispersal, the available habitat is not considered to be critical to the survival of the species. Large areas of similar habitat occur in the wider locality that are known to support the species that will remain.
Will the action disrupt the breeding cycle of a population	The Lord Howe Woodhen has been recorded from the subject land and is likely to breed there. Although there is suitable habitat in the subject land, this species habitat is abundant across the Island and the proposed action will likely remove only a small portion of potential breeding habitat for the species. As such, the breeding habitat within the subject land is not considered to be critical for the species and it is unlikely to disrupt the breeding cycle of any known population. The Lord Howe Placostylus has not been recorded within the subject land. While the Project will remove a very small area of potential habitat for the species around the existing waste facility, the habitat to be removed is minor given the large areas of suitable and known habitat to be retained in the study area. As such, the habitat to be removed is unlikely to disrupt the breeding cycle of any local populations of the Lord Howe Placostylus. No critical breeding sites for the Bar-tailed Godwit are known to occur within the subject land. This species does not breed within Australia and therefore the proposed action is considered unlikely to disrupt the breeding cycle of any known population of the species.
Will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The Lord Howe Woodhen has been recorded within the subject land and is known to occur. This species is highly abundant across the island and has adapted to utilise modified and urbanised habitat. The species is likely to use the habitat as part of a much larger foraging range. Large areas of similar or better habitat occur in the wider locality that will remain. Accordingly, the proposed action is considered unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Lord Howe Woodhen is likely to decline. The Lord Howe Placostylus has not been recorded within the subject land. As such, the Project will not remove any habitat within the known area of occupancy. Given the large areas of habitat to be retained within the study area, the removal of small areas of potential habitat outside of

Significant Impact Criteria	Response
	the known area of occupancy are considered unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline. The Bar-tailed Godwit, has the potential to occur in the subject land, although has not previously been recorded from the subject land. While the species has been assessed as having some potential to occur in the subject land, it is only likely to use the habitat sporadically as part of a much larger foraging range. Large areas of similar habitat occur in the wider locality that will remain. Accordingly, the Project is considered unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Given the World Heritage Value of Lord Howe Island, strict biosecurity measures are currently in place to ensure invasive species are not introduced to the island. Since the eradication of the Black Rat, there have been no records of invasive species that are harmful to critically endangered or endangered species. As such, the action is unlikely to result in invasive species becoming established in the endangered or critically endangered species' habitat.
Will the action introduce disease that may cause the species to decline	The Project is unlikely to lead to processes capable of introducing diseases that may cause these species to decline.
Will the action interfere with the recovery of the species	The Lord Howe Woodhen has been recorded within the subject land and is likely to breed there. According to the Lord Howe Woodhen Recovery Plan (NSW NPWS 2002), the rehabilitation plan for Lord Howe Woodhen has been one of the most successful ever implemented for any bird species. In the 1970's there was as few as 30 individuals remaining, and by 2002 there was as many as 127 individuals recorded. Furthermore, since the eradication of the Black Rat from the island, the abundance of the species has increased rapidly, with the species now highly abundant across the island (as evidenced by recent survey work). Today, the population of the Lord Howe Woodhen is significantly higher than what is recorded within the species recovery plan. Accordingly, the proposed action is considered unlikely to interfere with the recovery of the species as the primary threat (the Black Rat) has been eradicated from the island.

Significant Impact Criteria	Response
	The Lord Howe Placostylus has not been recorded within the subject land however is known to occur within the study area. There is currently no recovery plan in place for this species, however the EPBC SPRAT profile (DCCEEW (Cwlth), 2025) indicates a recovery plan is required for the species. It is likely that due to the limited number of remaining individuals, all populations of the Lord Howe Placostylus are important for conservation across its range. Due to the limited area of occupancy, extent of occurrence and habitat decline, all sites where the Lord Howe Placostylus has been detected are potentially important for species survival. As the subject land is located outside of the known area of occurrence, it is not considered important to the survival of this species. The Project will not remove any habitat within the known area of occupancy and given the large areas of suitable habitat to be retained within the study area, the Project is unlikely to interfere with the recovery of the species. While it is acknowledged that no specific studies of impacts of Black Rat on the Lord Howe Placostylus have been conducted, given that the Black Rat is known to impact invertebrates on the Australian mainland, the eradication of the Black Rat is likely to aid in the recovery of the species. No approved recovery plan has been published for the Bar-tailed Godwit. However, conservation advice identifies priority actions and threat mitigation for the species. Furthermore, all the Bar-tailed Godwit is listed under the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia 2015). Although the species has been assessed as having potential to occur in the subject land, it is only likely to use the habitat sporadically as part of a much larger foraging range. Large areas of similar habitat occur in the wider locality that will remain. The Project will remove a small area of potential habitat however this does not comprise critical habitat for the species and is considered unlikely to interfere with the recovery of the species.

Vulnerable Species

Eight threatened species listed under the EPBC Act as vulnerable are considered to have the potential to occur due to the availability of suitable foraging, roosting or breeding habitat within the subject land, or are known to occur within the subject land having been recorded during field surveys. Of these, four species are also listed as migratory species under the EPBC Act. The following sections include an assessment of significance for each

of the threatened species potentially occurring or known to occur within the subject land in accordance with the EPBC Act Significant Impact Criteria for vulnerable species.

B.3.2. Vulnerable Species

The following species listed as vulnerable under the EPBC Act have been assessed below.

- The Pied Currawong (known to occur);
- Lord Howe Island Skink (potential to occur); and
- Lord Howe Island Southern Gecko (potential to occur).

The Pied Currawong (Lord Howe Is. subsp.) has been recorded from the subject land and is known to occur in lowland, hill and mountain regions which occur within the locality of the subject land. This species is highly mobile and is known to utilise these habitats for both foraging and roosting purposes as part of their larger range.

The Lord Howe Island Skink was not recorded within subject land however was recorded within the North Zone study area in Howea palm forest with honeycombed beach rock partially embedded in the soil. The South Zone is also considered to provide potential habitat for the species within Howea Palm forests and within the dense grasslands on the coastal strand, however the species was not recorded in the South Zone during surveys.

The Lord Howe Island Southern Gecko was not recorded within the subject land however was recorded within the study area in both the North and South Zones. The species is known to favour lowland rainforests with rocky areas embedded in the soil. A small area of potential habitat is available within the subject land.

An assessment against the EPBC Significant Impact Criteria for the four vulnerable listed species is provided in **Table 18**.

Table 18 Significant Impact Criteria for Vulnerable Species

Significant Impact Criteria	Response
Will the action lead to a long-term decrease in the size of an important population of a species	The Pied Currawong (Lord Howe Is. subsp.) is known to occur within the subject land and the NSW BioNet Atlas holds 56 records within the locality. This species is highly mobile and while there is suitable habitat for the species within the subject land, there is a significant amount of suitable habitat remaining outside of the subject land. Given that the species is highly mobile and has an abundance of suitable habitat outside of the study area, the Project is not considered likely to lead to a long-term decrease in the size of a population for this species. The Lord Howe Island Skink has not been recorded within the subject land. However, the species was recorded six (6) times within the study area during field surveys in December 2024 and January 2025. The NSW BioNet Atlas

Significant Impact Criteria	Response
	holds a further 176 records within the locality. The subject land has been designed to avoid significant native vegetation as much as possible, and given the large areas to be retained within the study area, the small patches identified for removal within the subject land are not likely to lead to a long-term decrease in the size of a population of this species. The Lord Howe Island Southern Gecko has been recorded eight (8) times within the study area, including six (6) records in the North Zone and two (2) records within the South Zone. No records are located within the subject land. A further 16 records of the species were made during surveys within Steven's reserve and in bushland behind the Lord Howe Island Board offices on the track towards Transit Hill. The NSW BioNet Atlas holds a further 133 records of the species in the locality. The habitat to be removed within the subject land is considered to comprise a very small area of suitable habitat for the species and large areas of known habitat will be retained within the study area and wider locality. Given the species was not recorded within the subject land the Project is considered unlikely to lead to a long-term decrease in the size of a population for this species.
Will the action reduce the area of occupancy of an important population	The Pied Currawong (Lord Howe Is. subsp.) has been recorded in the subject land and is known to occur. This species is highly mobile and likely to utilise the available habitat in the subject land as part of their wider home range. Although it has been previously recorded and is known to occur, due to the high mobility and availability of suitable habitat outside of the subject land, the proposed action is considered unlikely to reduce the area of occupancy for the species. Both the Lord Howe Island Skink and the Lord Howe Island Southern Gecko have been recorded from the study area. However, neither species has been recorded within the subject land. Therefore, the potential habitat to be removed within the subject land will not reduce the known area of occupancy of either of these two species.
Will the action fragment an existing important population into two or more populations	The Pied Currawong (Lord Howe Is. subsp.) is a highly mobile species that forages over large areas and the removal of a small portion of potential habitat is unlikely to fragment any existing populations of this species.

Significant Impact Criteria	Response
	Neither the Lord Howe Island Skink or Lord Howe Island Southern Gecko have been recorded within the subject land. Potential habitat is available within the subject land, of which is proposed to be removed for the Project. Large areas of more suitable habitat where the species is known to occur will be retained. The removal of potential habitat is not considered likely to fragment an existing population into two or more populations, rather it will reduce the extent of potential habitat for a local population
Will the action adversely affect habitat critical to the survival of a species	Habitat critical to the survival of the assessed potentially occurring vulnerable species has not been identified in any conservation advice or recovery plan. Nevertheless, the small area of potential, habitat within the subject land is not considered to comprise critical habitat for the species. More suitable habitat within the known area of occupancy for these species will be retained within the study area. As such, the Project is not considered to adversely affect habitat critical to the survival of the assessed potentially occurring vulnerable species.
Will the action disrupt the breeding cycle of an important population	No critical breeding sites or critical habitat for the Pied Currawong (Lord Howe Is. subsp.) is known to occur within the subject land. This species has suitable habitat across the island and the available habitat within the subject land is not considered to be critical for the species. Accordingly, the proposed action is considered unlikely to disrupt the breeding cycle of any known population of the species. Both the Lord Howe Island Skink and the Lord Howe Island Southern Gecko have been recorded from the study area and potential habitat is available within the subject land. Suitable habitat for these two reptiles is present within both the North and South Zones despite the absence of records. Nevertheless, the subject land only comprises a small area of native vegetation that offers potential habitat to these two species, compared to the large areas of continuous habitat in the study area that will be retained and are known to support these two species given the records from targeted surveys. As neither species was recorded within the subject land, it is unlikely that the removal of a small area of potential habitat would disrupt the breeding cycle of either of these species populations.
Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The Pied Currawong (Lord Howe Is. subsp.) has been recorded within the subject land and is known to occur. While the species is known to utilise habitat within the subject land, the species is highly mobile and there is an

Significant Impact Criteria	Response
	abundance of suitable habitat in the study area and wider locality. The available habitat within the subject land is not considered critical to the species, and therefore the proposed action is considered unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. Neither the Lord Howe Island Skink or Lord Howe Island Southern Gecko have been recorded within the subject land. However, the species are considered to have the potential to occur given the availability of potential habitat and the occurrence of the species within nearby areas of the study area. The Project will remove a small area of potential habitat for these two species, however large areas of more suitable habitat will be retained within the study area, including areas that currently support a known population. As such, the removal of small areas of potential habitat are unlikely to result in a decline of the species.
Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Given the World Heritage Value of Lord Howe Island, strict biosecurity measures are currently in place to ensure invasive species are not introduced to the island. As such, the action is unlikely to result in invasive species becoming established in the vulnerable species' habitat
Will the action introduce disease that may cause the species to decline	The proposed action is unlikely to lead to processes capable of introducing diseases that may cause these species to decline.
Will the action interfere substantially with the recovery of the species	The Pied Currawong (Lord Howe Is. subsp.) has been recorded within the subject land and is known to occur. This species is highly mobile and is likely to utilise the available habitat within the subject land as part of a broader home range. Large areas of similar habitat occur in the wider locality that will remain. Accordingly, the proposed action is considered unlikely to interfere with the recovery of the species. Both the Lord Howe Island Skink and the Lord Howe Island Southern Gecko have been recorded within the study area, however neither species has been recorded within the subject land. Suitable habitat for these two species is available within the subject land. There is currently no recovery plan in place for either of these species. These species have been under serious threat due to predation by the Black Rat, of which has recently been eradicated from the island. It is expected that the control and eradication of the Black Rat will assist the survival of these

Significant Impact Criteria	Response
	threatened reptiles. Habitat disturbance and clearing is also known to be a threat to these two species, however given the large areas of available, and known, habitat within the study area, the removal of a small area of potential habitat within the subject land is unlikely to interfere substantially with the recovery of these two species.

B.3.3. Migratory Species

The following species listed as migratory under the EPBC Act has been assessed below.

- Wedge-tailed Shearwater (known to occur);

Note that the Bar-tailed Godwit, a migratory species, is listed in the Referral decision as threatened species and therefore has been assessed in ***Section B.3.1***.

The Wedge-tailed Shearwater has been recorded within the subject land during targeted bird surveys. The species was only recorded roosting/breeding the North Zone, with a single record of the species in the South Zone as a fly-over record.

Within the North Zone, the species has been recorded roosting and breeding, predominantly along the banks and cliffs that border the lagoon along the entire extent of the study area. Within these areas, breeding habitat comprises burrows within dense exotic grassland and native shrubby vegetation. The species has also been recorded roosting on top of the banks, within areas of mown lawns and also on roads. The small area of shallow water around the existing wharf is not considered suitable for foraging and as such no suitable foraging habitat is available within the subject land or study area.

An assessment against the EPBC Significant Impact Criteria for the Wedge-tailed Shearwater is provided in **Table 19**.

Table 19 Significant Impact Criteria for Migratory Species

Significant Impact Criteria	Response
Will the action substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	The habitat to be cleared within the subject land will include areas of known breeding habitat for the Wedge-tailed Shearwater. Breeding habitat is present within sections of native and exotic vegetation along the banks of the lagoon on either side of the existing wharf. A stretch of approximately 260m along the banks of the North Zone is used by the species for breeding, of which up to approximately 60m may be removed immediately adjacent to the existing wharf. Overall, breeding habitat for the species will be slightly reduced, however large areas of suitable breeding habitat will be retained.

Significant Impact Criteria	Response
	The species is a migratory, marine species that arrives on Lord Howe Island from Early August to early September. They will generally lay eggs from late November to early December, with birds fledging by late April to early May. Provided works are undertaken outside of the key breeding periods when the species is not present (or in very low numbers) on the island, then impacts to the species will be limited to the reduction of breeding habitat.
Will the action result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	The habitat proposed to be cleared within the subject land is considered to be important habitat for the Wedge-tailed Shearwater, however the proposed action is unlikely to result in an invasive species becoming established. Given the World Heritage Value of Lord Howe Island, strict biosecurity measures are currently in place to ensure invasive species are not introduced to the island.
Will the action seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	The subject land is considered to support an ecologically significant portion of the population of the Wedge-tailed Shearwater on Lord Howe Island. A small area of known breeding habitat is proposed to be removed as part of the proposed action. Works will be undertaken outside of the key breeding period when the species is absent (or in very low numbers) to prevent inadvertent impacts on the species. Areas of suitable breeding habitat have been avoided through the design of the Project, and where possible during the construction phase, further avoidance within the subject land will be undertaken so that the habitat to be removed is the minimum required to facilitate the Project. The areas of breeding habitat within the study area to be retained are not considered to be at carrying capacity and adequate habitat is available for birds that have been displaced to relocate and excavate new burrows. Although the proposed action will disturb a small portion of the local population, it is not considered likely to seriously disrupt the lifecycle of the Wedge-tailed Shearwater.

B.4. Application of the BAM to MNES

As identified in Chapter 11, the BAM does not apply to biodiversity endemic to Lord Howe Island and therefore an assessment in accordance with the BAM, including the calculation of offsets in accordance with the BOS cannot be undertaken. Nevetherless, this BDAR has been prepared in line with the BAM and includes an assessment of MNES.

B.5. Assessment of Impacts to MNES

The impacts to MNES comprise a mix of direct, indirect and prescribed impacts.

Direct impacts to MNES include clearing of vegetation and associated habitats, and are included within the assessments for vegetation communities and threatened and migratory species in ***Section 9.1 – 9.5*** of this BDAR.

Indirect impacts include factors such as edge effects, light spill, dust and weed incursion and are outlined in ***Section 9.6*** of this BDAR.

Prescribed impacts comprise impacts associated with human made structures, habitat connectivity, non-native vegetation, waterbodies and vehicle strike, and are detailed in ***Section 8.3*** and ***Section 9.7*** of this BDAR.

B.6. Measures to Avoid, Mitigate and Offset

Measures to avoid and minimise impacts, including impacts to MNES are presented in **Chapter 8** of the BDAR, and measures to mitigate and offset impacts are presented in **Chapter 10** and **Chapter 11**.

A range of mitigation measures have been developed for the Project to mitigate the impacts that are unable to be avoided on biodiversity values, including MNES entities. These include a range of measures to be undertaken before and during construction to limit the impact of the Project. It is envisaged that these mitigations measures will form part of the conditions of consent for the Project and all measures will be approved or endorsed by the Minister for Planning or delegate as part of the CSSI approval process.

The BAM sets a standard that will result in no net loss of biodiversity values where the impacts on biodiversity values are avoided, minimised and mitigation, and all residual impacts are offset by retirement of the required number of biodiversity credits. As identified in ***Section B.4***, the BAM does not apply to biodiversity endemic to Lord Howe Island and offsets cannot be calculated in accordance with the BOS. However, the Project has incorporated landscaping into the design to ensure that there is no net loss of native vegetation and associated habitat within the subject land. While a total of 0.75 ha or native vegetation will be removed within the subject land, a minimum of 0.75 ha of native vegetation is proposed to be replanted within the subject land. Species characteristic of the existing vegetation communities will be used for revegetation with all species sourced from the Lord Howe Island Nursery. It is expected that the establishment of native vegetation within the subject land which is greater in area than that proposed to be removed for the Project will satisfy the offsetting requirements of the Project.

APPENDIX C :
Protected Matters Search Tool

EPBC Act Protected Matters Report

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

Report created: 09-Apr-2025

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

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

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	58
Listed Migratory Species:	46

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	47
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	2
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	9
Key Ecological Features (Marine):	None
Biologically Important Areas:	22
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties [Resource Information]

Name	State	Legal Status	Buffer Status
Lord Howe Island Group	NSW	Declared property	In feature area

National Heritage Places [Resource Information]

Name	State	Legal Status	Buffer Status
Natural			
Lord Howe Island Group	NSW	Listed place	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Breeding known to occur within area	In feature area
Hypotaenidia sylvestris Lord Howe Woodhen [87732]	Endangered	Breeding likely to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pterodroma heraldica Herald Petrel [66973]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In feature area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
Strepera graculina crissalis Lord Howe Island Currawong, Pied Currawong (Lord Howe Island) [25994]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
FISH			
Amphiprion mccullochi Whitesnout Anemonefish, McCulloch's Anemonefish [76925]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
INSECT			
Cormodes darwini a beetle [92235]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Promethis sterrha a beetle [92260]	Critically Endangered	Species or species habitat known to occur within area	In feature area
MAMMAL			
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area	In feature area
OTHER			
Pericryptodrilus nanus Lord Howe Earthworm [84736]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
PLANT			
Anthosachne kingiana subsp. kingiana Phillip Island Wheat Grass [87946]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calystegia affinis [48909]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Geniostoma huttonii [56368]	Endangered	Species or species habitat known to occur within area	In buffer area only
Lepidorrhachis mooreana Little Mountain Palm, Moorei Palm [6388]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Polystichum moorei Rock Shield Fern [40755]	Endangered	Species or species habitat likely to occur within area	In feature area
Xylosma parvifolia [48040]	Endangered	Species or species habitat known to occur within area	In buffer area only
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Christinus guentheri Lord Howe Island Gecko, Lord Howe Island Southern Gecko [59250]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Oligosoma lichenigerum			
Lord Howe Island Skink [91467]	Vulnerable	Species or species habitat known to occur within area	In feature area
SHARK			
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Galeorhinus galeus			
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In feature area
Sphyrna lewini			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
SNAIL			
Gudeoconcha sophiae magnifica			
Magnificent Helicarionid Land Snail [82864]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Mystivagor mastersi			
Masters' Charopid Land Snail [81247]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Placostylus bivaricosus			
Lord Howe Flax Snail, Lord Howe Placostylus [66769]	Endangered	Species or species habitat known to occur within area	In feature area
Pseudocharopa ledgbirdi			
Mount Lidgbird Charopid Land Snail [85279]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Pseudocharopa whiteleggei			
Whitelegge's Land Snail [81249]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus			
Common Noddy [825]		Breeding known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Breeding known to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phaethon rubricauda Red-tailed Tropicbird [994]		Breeding known to occur within area	In feature area
Sula dactylatra Masked Booby [1021]		Breeding known to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area	In feature area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat may occur within area	In feature area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous albivitta as Procelsterna cerulea			
Grey Noddy, Grey Ternlet [91286]		Breeding known to occur within area	In feature area
Anous stolidus			
Common Noddy [825]		Breeding known to occur within area	In feature area
Ardenna carneipes as Puffinus carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Breeding known to occur within area	In feature area
Ardenna grisea as Puffinus griseus			
Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Ardenna pacifica as Puffinus pacificus			
Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus			
Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Diomedea antipodensis](#) Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Diomedea antipodensis gibsoni as Diomedea gibsoni](#) Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Diomedea epomophora](#) Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Diomedea exulans](#) Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Fregata ariel](#) Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In feature area
[Fregata minor](#) Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area	In feature area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area	In feature area
Phaethon rubricauda Red-tailed Tropicbird [994]		Breeding known to occur within area	In feature area
Pterodroma cervicalis White-necked Petrel [59642]		Breeding likely to occur within area	In feature area
Pterodroma nigripennis Black-winged Petrel [1038]		Breeding known to occur within area	In feature area
Pterodroma solandri Providence Petrel [1040]		Breeding known to occur within area	In feature area
Puffinus assimilis Little Shearwater [59363]		Breeding known to occur within area	In feature area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sula dactylatra Masked Booby [1021]		Breeding known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche bulleri](#) Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche bulleri platei as Thalassarche sp. nov.](#) Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche carteri](#) Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Thalassarche impavida](#) Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Thalassarche salvini](#) Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Fish			
[Cosmocampus howensis](#) Lord Howe Pipefish [66208]		Species or species habitat may occur within area	In feature area
[Halicampus boothae](#) Booth's Pipefish [66218]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area	In feature area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area	In feature area
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In feature area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area	In feature area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area	In feature area
Feresa attenuata Pygmy Killer Whale [61]		Species or species habitat may occur within area	In feature area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area	In feature area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area	In feature area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area	In feature area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area	In feature area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat may occur within area	In feature area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area	In feature area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area	In feature area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area	In feature area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area	In feature area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area	In feature area
Peponocephala electra Melon-headed Whale [47]		Species or species habitat may occur within area	In feature area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area	In feature area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area	In feature area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In feature area
Stenella coeruleoalba Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Stenella longirostris Long-snouted Spinner Dolphin [29]		Species or species habitat may occur within area	In feature area
Steno bredanensis Rough-toothed Dolphin [30]		Species or species habitat may occur within area	In feature area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Lord Howe Island	Permanent Park Preserve	NSW	In feature area
Lord Howe Island	Marine Park	NSW	In feature area

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Action clearly unacceptable				
Lord Howe Island Renewable Energy Project - Stage 2 Wind Turbines	2016/7790	Action Clearly Unacceptable	Completed	In feature area
Controlled action				
Lord Howe Island Rodent Eradication Project, NSW	2016/7703	Controlled Action	Post-Approval	In feature area
Not controlled action				
Air Traffic Control Infrastructure Facility	2007/3872	Not Controlled Action	Completed	In buffer area only
Lord Howe Island Solar Photovoltaic Project	2015/7544	Not Controlled Action	Completed	In feature area
Pilot study - Short term captive holding of 22 LHI Woodhen & 10 LHI Currawong, Lord Howe Island	2013/6847	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Seismic Station	2007/3301	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Lowering Blinky Beach Sand Dune to Comply with CASA Regulations for Runway 28, Lord Howe Island	2012/6599	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Survey and Sampling of Lord Howe Island Reef	2008/3986	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Referral decision				
Hybrid Renewable Energy (Solar & Wind Turbine), Lord Howe Island, NSW	2014/7231	Referral Decision	Completed	In feature area

Biologically Important Areas			[Resource Information]
Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Anous minutus Black Noddy [824]	Breeding	Known to occur	In feature area
Anous stolidus Common Noddy [825]	Breeding	Known to occur	In feature area
Anous stolidus Common Noddy [825]	Foraging	Likely to occur	In feature area
Ardenna carneipes Flesh-footed Shearwater [82404]	Breeding	Known to occur	In feature area
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur	In feature area
Ardenna tenuirostris Short-tailed Shearwater [84292]	Breeding	Known to occur	In feature area
Fregetta grallaria grallaria White-bellied Storm Petrel [64438]	Breeding	Known to occur	In feature area
Fregetta grallaria grallaria White-bellied Storm Petrel [64438]	Foraging	Likely to occur	In feature area
Gygis alba White Tern [807]	Breeding	Known to occur	In feature area

Scientific Name	Behaviour	Presence	Buffer Status
Gygis alba White Tern [807]	Foraging	Likely to occur	In feature area
Onychoprion fuscata Sooty Tern [82847]	Breeding	Known to occur	In feature area
Onychoprion fuscata Sooty Tern [82847]	Foraging	Likely to occur	In feature area
Phaethon rubricauda Red-tailed Tropicbird [994]	Breeding	Known to occur	In feature area
Procelsterna cerulea Grey Ternlet [64378]	Breeding	Known to occur	In feature area
Pterodroma macroptera Great-winged Petrel [1035]	Foraging	Likely to occur	In feature area
Pterodroma neglecta neglecta Kermadec Petrel [64450]	Foraging	Likely to occur	In feature area
Pterodroma nigripennis Black-winged Petrel [1038]	Breeding	Known to occur	In feature area
Pterodroma nigripennis Black-winged Petrel [1038]	Foraging	Likely to occur	In feature area
Pterodroma solandri Providence Petrel [1040]	Breeding	Known to occur	In feature area
Puffinus assimilis Little Shearwater [59363]	Breeding	Known to occur	In feature area
Sula dactylatra Masked Booby [1021]	Breeding	Known to occur	In feature area
Whales			
Megaptera novaeangliae Humpback Whale [38]	Migration	Known to occur	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

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

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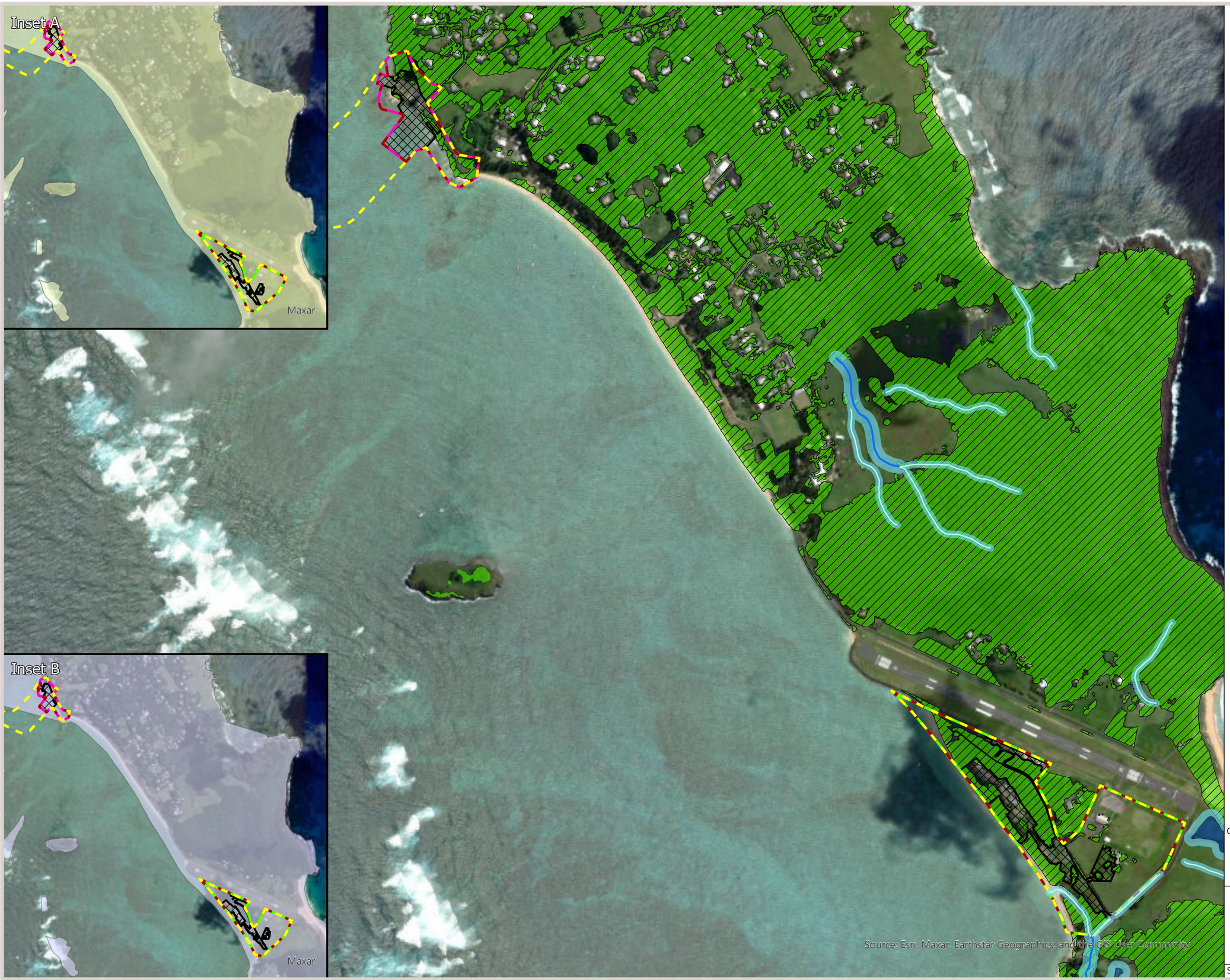
FIGURES



Legend

- Subject Land
- Study Area
- North Zone
- South Zone
- Program Area
- Native Vegetation Cover
- Patch Size
- Riparian Corridor
- Local Wetlands and Waterbodies

Watercourses

- 1st Order Stream
- 2nd Order Stream

Inset A: IBRA Region

- Pacific Subtropical Islands

Inset B: IBRA Subregion

- Lord Howe Island

Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services
Interim Biogeographic Regionalisation for
Australia (IBRA), Version 7 (Regions, Subregions)
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the Environment and Water 2016

cumberland ecology

Spatial Reference: GDA 1994 MGA Zone 57

0 70 100 300 400 600 m

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Figure 1. Site map

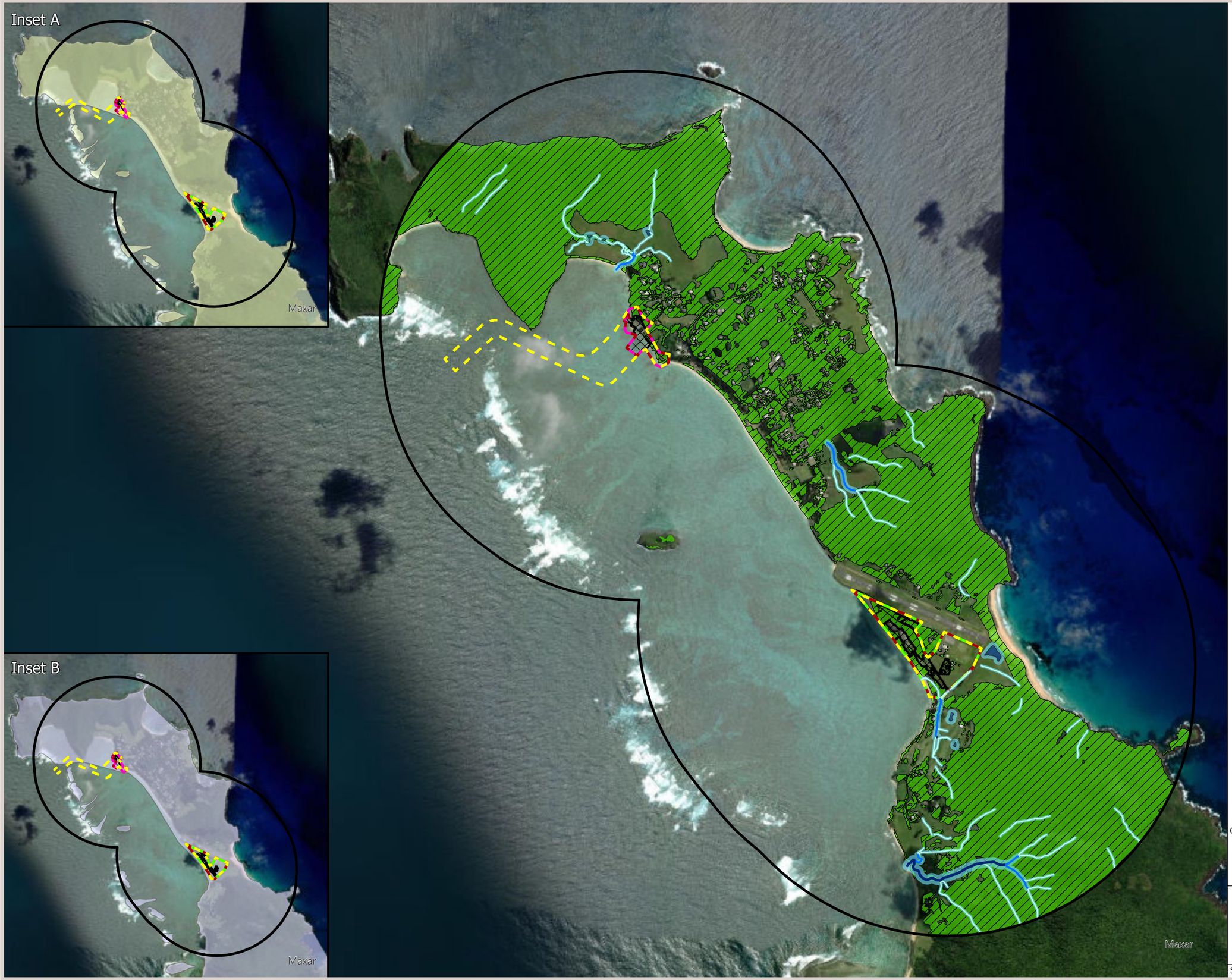

Figure 2. Location map

Legend

- Subject Land
- Study Area
- North Zone
- South Zone
- Program Area
- Assessment Area
- Native Vegetation Cover
- Patch Size
- Riparian Corridor
- Local Wetlands and Waterbodies

Watercourses

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream

Inset A: IBRA Region

- Pacific Subtropical Islands

Inset B: IBRA Subregion

- Lord Howe Island

Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services
Interim Biogeographic Regionalisation for
Australia (IBRA), Version 7 (Regions, Subregions)
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Spatial Reference: GDA 1994 MGA Zone 57

0 200 300 600 1,000 1,000 m

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Image Source: ERM 2025

Figure 3. Proposed development layout within the North Zone

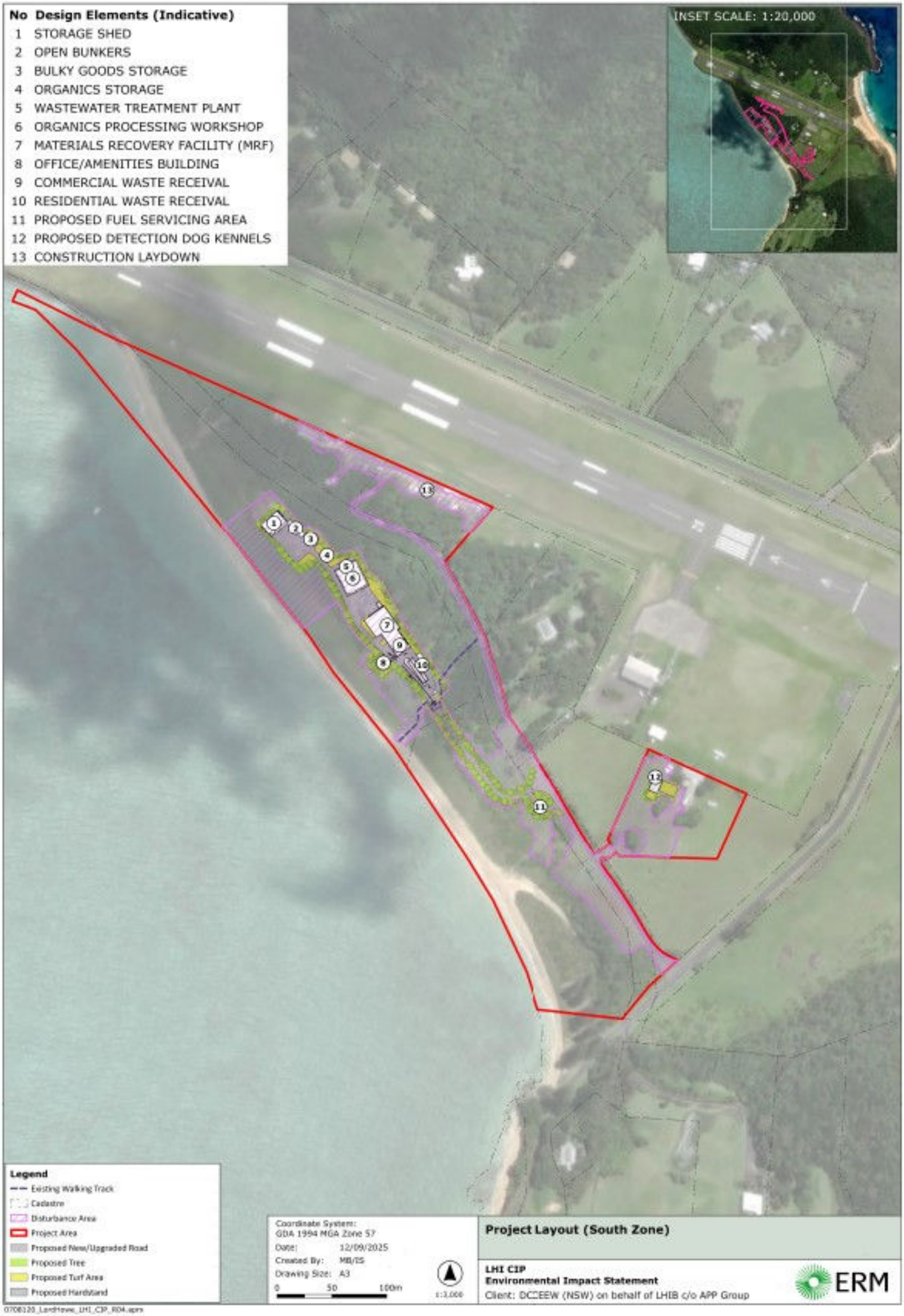

Image Source: ERM 2025

Figure 4. Proposed development layout within the South Zone

Legend

- Subject Land
- Study Area
- North Zone
- Survey Tracks
- BAM Plot Locations

Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

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Spatial Reference: GDA 1994 MGA Zone 57

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Figure 5. Flora survey locations within the North Zone

Legend

- Subject Land
- Study Area
- South Zone
- Survey Tracks
- BAM Plot Locations
- Rapid Data Point

Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

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Spatial Reference: GDA 1994 MGA Zone 57

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Figure 6. Flora survey locations within the South Zone

Figure 7. Fauna survey locations

Figure 8. Native vegetation extent

Legend

- Subject Land
- Study Area
- South Zone
- North Zone

Vegetation Extent

- Native Vegetation
- Exotic Vegetation
- Cleared
- Beach
- Water

Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

cumberland ecology

Spatial Reference: GDA 1994 MGA Zone 57

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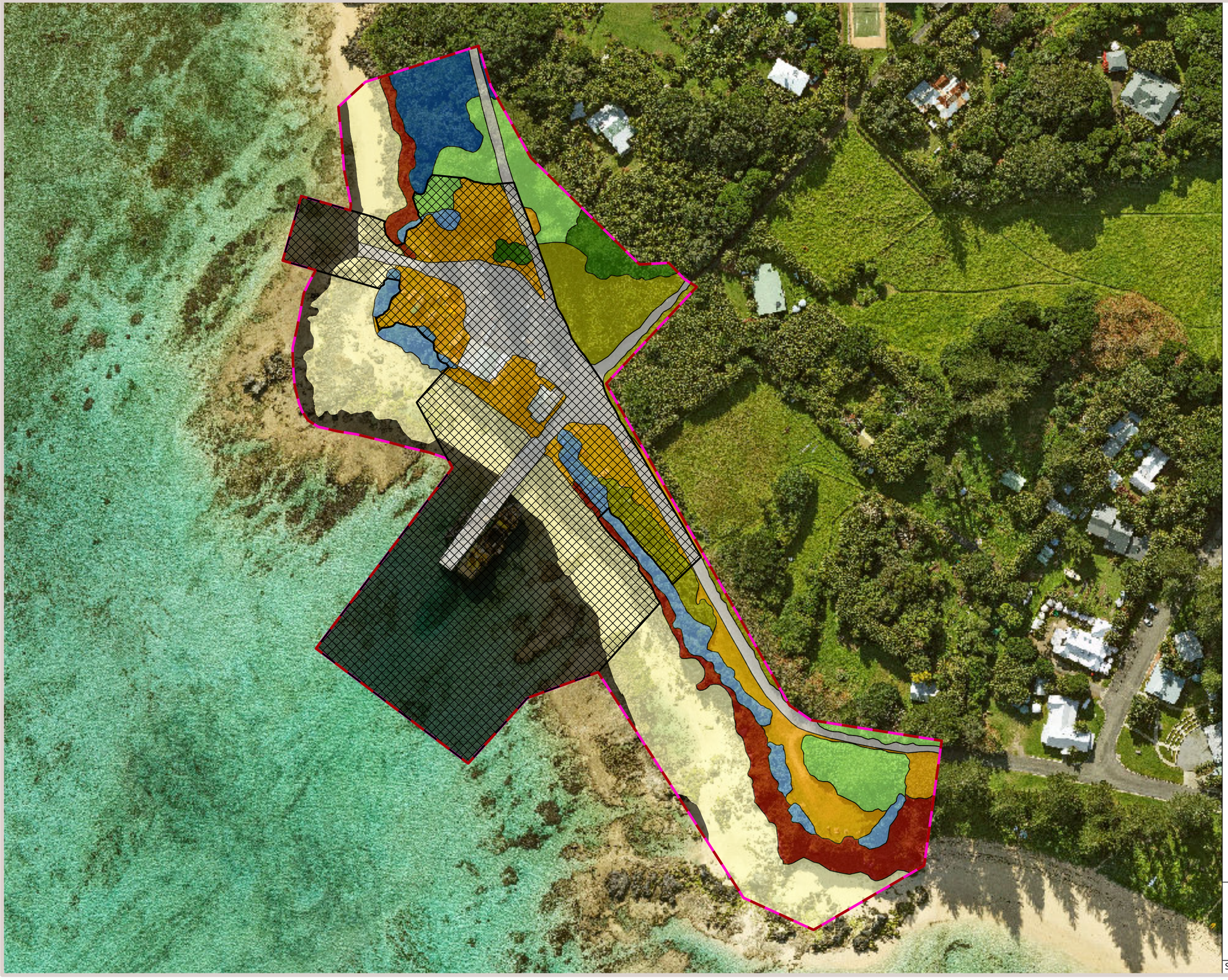
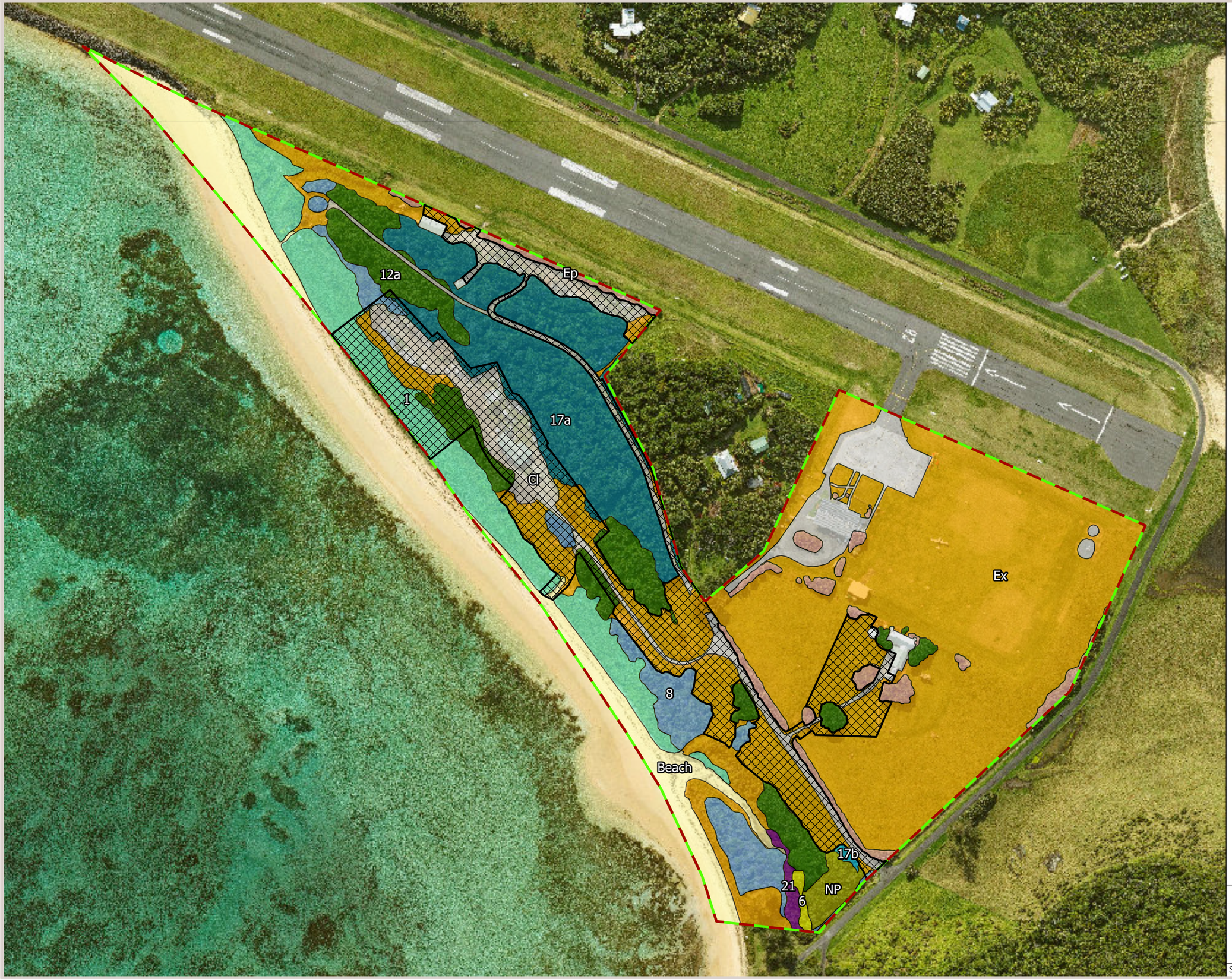


Figure 9. Vegetation communities within the North Zone



Legend

- Subject Land
- Study Area
- South Zone

Vegetation Community

- 1: Coastal Spinifex - Dune Bean - Club Rush - Melanthera biflora - Saltwater Couch beach strandline grassland
- 12a: Kentia Palm Forest on coral sand and calcarenite
- 17a: Greybark - Blackbutt rainforest
- 17b: Greybark - Blackbutt low closed forest on exposed basalt slopes
- 21: River Mangrove tall shrubland of brackish creeks
- 6: Sallywood swamp forest of poorly drained, low-lying areas
- 8: Bully Bush – Hopwood shrubland on shallow rocky soils
- NP: Plantation
- Ep: Environmental plantings
- Ex: Exotic Vegetation
- Cl: Cleared
- Beach

Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

cumberland ecology

Spatial Reference: GDA 1994 MGA Zone 57

0 10 20 40 60 80 m

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Figure 10. Vegetation communities within the South Zone

Legend

- Subject Land
- Study Area
- South Zone
- North Zone

Threatened Ecological Community

- Lagunaria Swamp Forest on Lord Howe Island

Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

cumberland ecology

Spatial Reference: GDA 1994 MGA Zone 57

0 75 150 300 450 600 m

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Figure 11. Threatened ecological communities within the study area

Figure 12. Threatened fauna recorded within the study area

Figure 13. Migratory fauna recorded within the study area

Figure 14. Prescribed impacts

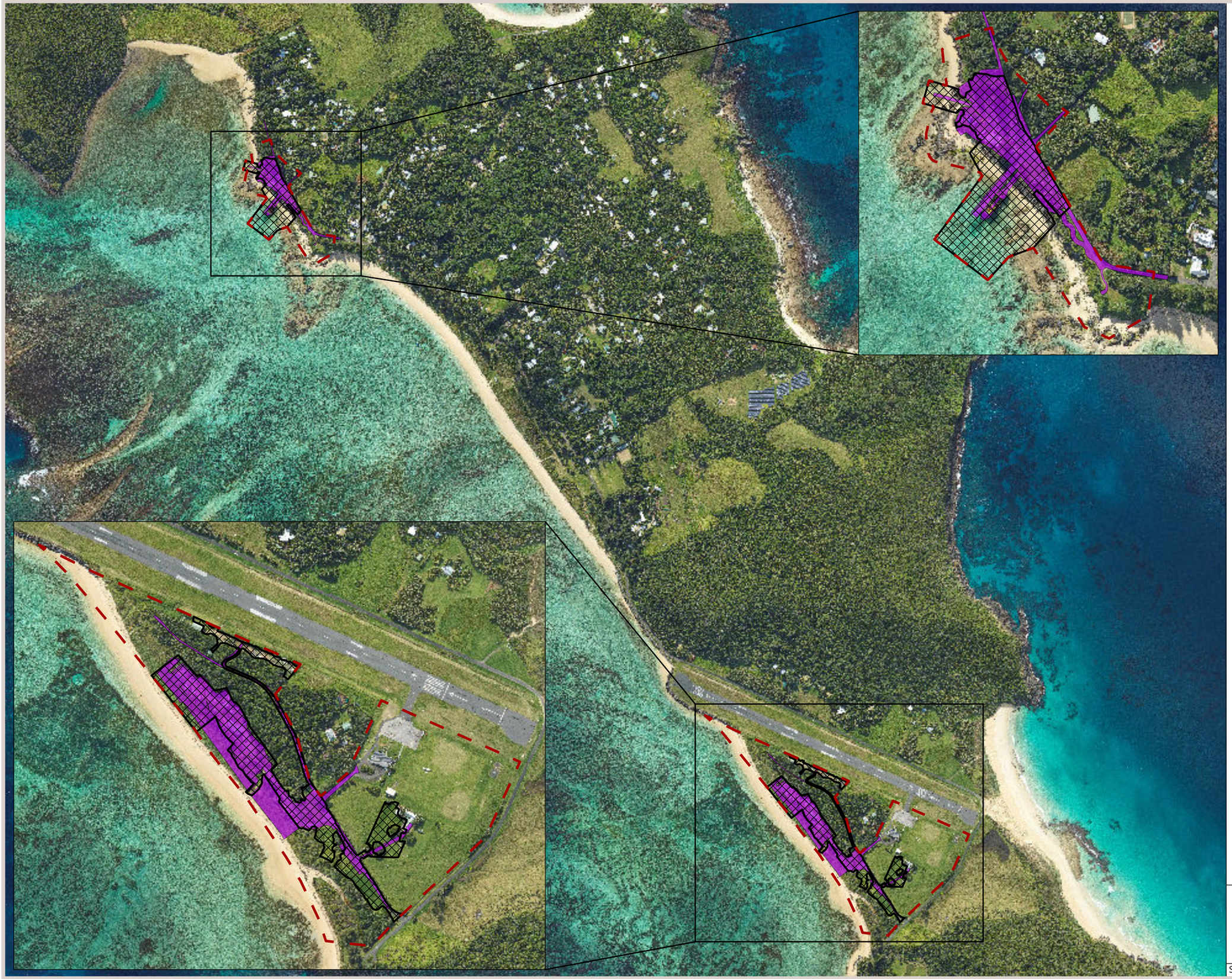

Figure 15. Comparison between the original disturbance footprint and the subject land

Figure 16. Vegetation to be directly impacted within the subject land

Legend

- Subject Land
- Study Area
- North Zone

Image Source: Image © 2025 Google
Dated: August 2006
Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

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Spatial Reference: GDA 1994 MGA Zone 57

0 20 40 80 120 160 m

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Figure 17. Historical imagery for the North Zone

Legend

- Subject Land
- Study Area
- North Zone
- South Zone

Image Source: Image © 2025 Google
Dated: August 2006
Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services

cumberland ecology

Spatial Reference: GDA 1994 MGA Zone 57

0 20 40 80 120 160 m

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Figure 18. Historical imagery for the South Zone