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PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2024/1495

Date: 03 February 2025

Queensland
Government

May 11, 2023

Peter Kelley
CEO
Redland Investment Corporation

RE: Proposed Works associated with Moreton Bay Marine Park.

Dear Peter,

We (BAAM Pty Ltd) have been engaged by Redland Investment Corporation (RIC) to prepare this advice report to accompany and inform an application for a Marine Park Permit to undertake work within Moreton Bay Marine Park and specifically within the Weinam Creek Priority Development Area (WCPDA).

Introduction and Background

Weinam Creek is located approximately 35 km southeast of Brisbane. The project location is part of the Weinam Creek Priority Development Area (WCPDA) and shown on **Image 1**. Development within the WCPDA has commenced with a range of infrastructure, commercial and community facilities having already been constructed.

Moreton Bay Marine Park contributes to the conservation and reasonable use of significant marine natural resources. This is achieved through zoning and designated areas. The proposed works are located with both the General Use Zone and the Habitat Protection Zone in a part of the marine park that is recognised as an important movement corridor for public transport vessels, recreational and commercial fisheries.

The WCPDA has stated objectives are detailed below:

- Weinam Creek is a point of community focus and a regional gateway to Moreton Bay and the Southern Moreton Bay Islands. The development within the WCPDA supports the potential to stimulate tourism to the islands, improving the Southern Moreton Bay Islands economies and the wider sub regional economy and aims to: Accommodate passenger and vehicle ferry traffic.
- To embrace open spaces and the waterfront location.
- Provide appropriate infrastructure that meets expectations for safety, comfort, convenience, information, and service delivery.
- Support needs of local community and projected growth.
- Support Aboriginal stewardship and reconciliation.

The proposed works are intended as a part of the overall revitalisation and upgrading of the WCPDA waterfront precinct (Precinct 1) and delivery of a range of public and community infrastructure. works

included in this application, are proposed towards achieving the WCPDA vision and to support the surrounding site modifications approved for the WCPDA.

I undertook a site inspection of the proposed works area on 14th March 2023. The site inspection sought to ascertain any specific ecological values associated with the works areas and their immediate surrounds. The site inspection was timed to coincide with a low tide to allow clear identification of the works areas and adjoining substrates.

In addition to the site inspection to inform this advice, BAAM has previously undertaken several site assessments across the WCPDA. Of relevance, for background understanding, to this application is the original ecological assessment for the WCPDA Structure Planning (**Attachment 1**), which included detailed assessment of marine and coastal processes in this location.

Work areas

The proposed works areas are part of the WCPDA -Precinct 1. This area is proposed for an upgrade to meet current demands and to further improve the area's function as a major harbor to the Southern Moreton Bay islands. **Image 1** portrays a visual image of the finalised WCPDA landscape.

Further details on the proposed works are provided separately in the application.

The work comprises two upgrades to existing stormwater outlets (points 1-2 on **Image 2**) and one new stormwater outlet (point 3 on Image 2). There are also two areas proposed for the provision of terraces (points 4 & 5 on **Image 1**), designed to mimic natural rock step downs, to facilitate improved safe access and viewing points to the water edge. Photos and descriptions of the proposed works area are provided as **Attachment 2**.

The works areas are all located where artificial revetment walls, comprising rock walls or concrete embankments, provide the interface with the marine environments. The works locations are highly modified environments. Although modified, these areas are still within the Moreton Bay Marine Park, though all works, other than the proposed terraces at Point 5, are within an area identified as 'General Use' of the Moreton Bay Marine Park reflecting the existing harbor and associated uses in this location. The northernmost terraces are proposed within an area where the General Use Zone converts to the Habitat Protection Zone.

The works are wholly located within the WCPDA and are therefore subject to the provisions of the WCPDA Development Scheme. However, as the proposed works are within the Moreton Bay Marine Park, under Part 3, Division 1, Section 8 of the *Marine Parks Act Regulation 2017*, a person may apply to the chief executive for the grant of permission for a marine park or a part of a marine park.

It is noted that in this instance, as the works are located within a PDA, Schedule 10 Part 17 of the *Planning Regulation 2017* does not apply as the works are PDA related development (Section 28 (2) (c)).



Image 1: Showing 02LA Landscape Master Plan for the Weinam Creek WCPDA.



Image 2: Showing indicative works type and locations.

Potential Impacts

Although the work locations are within areas which have been previously highly modified, it is important that the works and any subsequent uses such as water quality at storm water outlets are appropriately managed. This review has not identified any potential for significant impacts on marine environments. We have identified one potential impact associated with the provision of terraces facilitating access to the water. Although this may encourage additional recreational uses within the intertidal zone, the terraces have been located to address existing recreational uses including accessing the intertidal area and associated safety concerns regarding ingress and egress via the existing rock wall structures.

In respect to the proposed construction activities, the works are proposed to be undertaken in accordance with construction activities outlined below. The proposed stormwater outlets are wholly contained within and do not extend beyond the existing rock wall/revetments.

The proposed terraces (Points 4 & 5 on **Image 1**) will result in a very minor loss of intertidal habitats and associated benthic fauna. My site investigation confirmed the findings of the original ecological assessment (**Attachment 1**) that this location does not provide any notable habitat or foraging values for Migratory Waders and the extant benthic fauna presence and activity is very low. There is no sea grass or marine plants within the proposed works areas.

The proposed construction work will not have any significant impacts on the ecological values or marine processes in the locations proposed. The terraces will essentially provide the same habitat values as the existing revetment wall.

In respect to potential impacts such as disturbance to migratory waders, these birds start moving Northwards from March onwards and Moreton Bay sees peak numbers of birds occurring in March and early April, when our own over-summering migratory birds are further supplemented by the visitation of more southerly birds passing through the area as seasonal migration movements begin[1].

The site investigations to inform this advice (low tide on 20/03/2023) was timed to allow for detailed views of the proposed works areas at low tide and to further investigate if the WCPDA area was being utilised by any migratory waders as feeding habitat. No migratory or resident waders were observed within or proximate to the proposed works. There is no roost within or proximate to the Weinam Creek WCPDA.

We have previously considered the relevance of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) of the WCPDA. It is very clear that the proposed actions would not be viewed as requiring a referral.

Construction Methodology

Stormwater Outlets

The Stormwater outlets will require the use of standard earthmoving equipment (such as an excavator) to remove the existing structure and excavate bedding for new pipe work. The same type of equipment would be used for installation of the new bedding, pipework and backfill.

[1] See- https://waders.org.au/about-waders/shorebird-migration/

All mechanical equipment will operate from the bank above the intertidal zone with no access into tidal waters required. However, the construction crew will require access to the tidal areas on foot during construction.

The maximum disturbance of personnel movements within the intertidal areas, beyond the existing revetment walls, will be a maximum of 5m x 5m.

As noted on the detailed drawings (provided separately in permit application package) it is proposed to install a precast concrete headwall at the stormwater outlets to minimise time spent in the marine environment and disturbance associated with construction activities. Rock protection or concrete will be reinstated around the outlets. The proposed invert level of the new pipes has been kept above the existing natural surface level to avoid any additional excavation of the surrounding area and again towards minimisation of disturbance to marine environments.

At all times during the construction process sediment and erosion control measures would be in place with daily monitoring to be undertaken. A completion report and photos will be provided.

The above preliminary site management measures shall be further detailed within erosion and sediment control plan, and CEMP required to be prepared by the construction contractor.

Proposed Terraces

The proposed terraces will be undertaken with the use of standard earthmoving equipment (such as an excavator) to remove the required portions of the existing revetment structure and excavate bedding. The same type of equipment would be used for installation of any new bedding, rocks and backfill of removed materials.

All mechanical equipment will operate from the bank above the intertidal zone with no access into tidal areas required by machines. Concrete will be pumped or poured from the existing embankment. However, the construction crew will require access to the tidal areas on foot for construction, formation and concreting, of the proposed terraces.

The maximum disturbance of personnel movements within the intertidal areas, beyond the existing revetment walls, will be a maximum of 5m x 5m beyond the proposed terraces. These areas are already regularly traversed by recreational users.

Rock protection or concrete will be reinstated around the constructed terraces to mimic existing and natural environments.

At all times during the construction process sediment and erosion control measures would be in place with daily monitoring to be undertaken. A completion report and photos will be provided.

Preliminary site management measures are outlined below and in supporting information. Detailed construction plans will be further developed and accompanied by supporting plans, including an erosion and sediment control plan and CEMP required to be prepared by the construction contractor.

Summary and Comments

The locations and surrounds of the proposed works are all highly modified environments. The proposed works are required as part of the WCPDA upgrade. The proposed construction methods and related activities will not result in any disturbances to important marine environments or migratory shorebirds.

Overall, it is my view the proposed actions will not result in any significant or long-term impacts on the Moreton Bay Marine Park or its habitats. The proposed construction methods will all be undertaken from the terrestrial areas and no direct impacts, other than the minor loss of intertidal habitats from the proposed terraces, will occur.

An important consideration of any ecological impacts is avoidance where practical. It is my understanding that, due to the type and nature of civil works required, there is no practical means by which avoidance can be further achieved above current designs.

I have not identified any additional actions, other than the required construction management plans which will be part of construction contractor conditions, required to ensure the works are appropriate for the location.

I trust the above provides sufficient details for your, and Marine parks assessment officers, considerations of the proposed actions.

Yours sincerely





Adrian Caneris CEnvP (Ecology Specialist)
Managing Director
Biodiversity Assessment and Management Pty Ltd

Attachment 1

BAAM Ecological (Terrestrial and Marine) Assessment
Toondah Harbor & Weinam Creek WCPDA's



TOONDAH HARBOUR AND WEINAM CREEK, REDLAND CITY

EXPERT ADVICE IN ECOLOGY (MARINE AND TERRESTRIAL) AND COASTAL PROCESSES FOR INPUT TO THE PREPARATION OF A STRUCTURE PLAN AND DEVELOPMENT SCHEME FOR TOONDAH HARBOUR AND WEINAM CREEK PRIORITY DEVELOPMENT AREAS

Report prepared for Redland City Council

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Document Control Sheet

File Number: 0015-063

Project Manager/s: Dr Penn Lloyd (BAAM) and Dr Simon Walker (frc environmental)

Client: Redland City Council

Project Title: Expert advice in ecology (marine and terrestrial) and coastal processes for input to the preparation of a structure plan and development scheme for Toondah Harbour and Weinam Creek Priority Development Areas (PDAs)

Project Author/s: Dr Penn Lloyd, Adrian Caneris, Dr Jo Chambers and Lui Weber (BAAM), and Dr Simon Walker (frc environmental)

Project Summary: This project provides a review and preliminary field assessment of the ecological values with the Toondah Harbour and Weinam Creek Priority Development Areas (PDAs), provides expert advice in ecology (marine and terrestrial), coastal processes and impact assessment to inform the comparative assessment of alternative development options for the PDAs, and provides an assessment of benefits and legislative considerations for the preferred options for each PDA.

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Purpose of Report

Biodiversity Assessment and Management Pty Ltd has produced this report in its capacity as {consultants} for and on the request of Redland City Council (the "Client") for the sole purpose of providing expert advice in ecology (marine and terrestrial) and coastal processes for input to the preparation of a structure plan and development scheme for Toondah Harbour and Weinam Creek Priority Development Areas (the "Specified Purpose"). This information and any recommendations in this report are particular to the Specified Purpose and are based on facts, matters and circumstances particular to the subject matter of the report and the Specified Purpose at the time of production. This report is not to be used, nor is it suitable, for any purpose other than the Specified Purpose. Biodiversity Assessment and Management Pty Ltd disclaims all liability for any loss and/or damage whatsoever arising either directly or indirectly as a result of any application, use or reliance upon the report for any purpose other than the Specified Purpose.

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Signed on behalf of
Biodiversity Assessment and Management Pty Ltd

Date: 17th January, 2014



Managing Director

EXPERT ADVICE IN ECOLOGY (MARINE AND TERRESTRIAL) AND COASTAL PROCESSES FOR INPUT TO THE PREPARATION OF A STRUCTURE PLAN AND DEVELOPMENT SCHEME FOR TOONDAH HARBOUR AND WEINAM CREEK PRIORITY DEVELOPMENT AREAS

REDLAND CITY

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Appendix 4: Conservation significant flora and fauna species identified in the desktop assessment and their likelihood of occurrence in the Weinam Creek PDA

Table of Terms and Abbreviations

BAAM	Biodiversity Assessment and Management Pty Ltd
DEHP	Queensland Department of Environment and Heritage Protection
DERM	Queensland Department of Resource Management (now DEHP)
DEWHA	Commonwealth Department of Environment, Water, Heritage and the Arts (now DoE)
DoE	Commonwealth Department of the Environment (previously DEWHA, SEWPaC)
ED Act	Queensland *Economic Development Act 2012*

EDQ	Economic Development Queensland
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EVNT	Species listed as endangered, vulnerable or near threatened under the EPBC Act and/or NC Act
KSPRP	South East Queensland Koala Conservation State Planning Regulatory Provisions
ILUP	Interim Land Use Plan
MNES	Matters of National Environmental Significance (under the EPBC Act)
MSES	Matters of State Environmental Significance (under the SPP)
NC Act	Queensland *Nature Conservation Act 1992*
PDA	Priority Development Area
Ramsar Convention	*Convention on Wetlands of International Importance 1971*
RCC	Redland City Council
RE	Regional Ecosystem
SEWPaC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now Department of the Environment)
SPA	Queensland *Sustainable Planning Act 2009*
SPP	Queensland State Planning Policy
TEC	Threatened Ecological Community (under the EPBC Act)
VM Act	Queensland *Vegetation Management Act 1999*

1.0 INTRODUCTION

1.1 BACKGROUND

Toondah Harbour and Weinam Creek were declared as Priority Development Areas (PDAs) in Redland City by the State Government under the *Economic Development Act 2012* (ED Act) on 21 June 2013. Redland City Council (RCC) has identified the potential for these PDAs to deliver long-term, sustainable economic growth for Redland City in a number of ways, including but not limited to:

- the generation of employment in a range of sectors across the economy;
- providing much needed infrastructure that will generate economic activity and improved public amenity both for the mainland and the islands; and
- working towards Council's goal of employment containment within the City through the generation of increased economic activity and industry growth.

An Interim Land Use Plan (ILUP) has been prepared for each site. This is a legislated requirement under Section 38 of the ED Act, which will regulate development in the PDA. This ILUP expires 12 months after the declaration of a PDA or when a development scheme is adopted, whichever is sooner.

The next step, under Section 55 of the ED Act, is the preparation of a Development Scheme for the PDAs, which is a statutory instrument and will include:

- a land use plan that regulates development in the PDAs;
- an infrastructure plan for the PDAs; and
- an implementation strategy, if this is not achieved through the land use or infrastructure plans.

Economic Development Queensland (EDQ) has taken the lead role as plan maker for the sites, while RCC has responsibility for undertaking development assessment. The Structure Plan will be integrated into the proposed Development Scheme. The proposed Development Scheme was presented to the EDQ Board on 25 November 2013, with a view to public notification from 16 December 2013 to 21 February 2014.

To assist in achieving one of the EDQ's objectives to streamline the planning process, it is important that the Development Scheme guides future development assessment in these areas and 'frontloads', as much as practicable, requirements for desired planning and development outcomes. The implication of this approach is that elements such as the identification of ecology (marine and terrestrial) and coastal process issues within the PDAs need to be assessed and incorporated into the preparation of the Development Scheme rather than deferred to the development assessment phase.

1.2 PROJECT OBJECTIVES

The primary objective of the project is to provide expert advice on ecology (marine and terrestrial) and coastal processes to inform the preparation of the Structure Plan and PDA Development Scheme including:

- specialist advice in relation to ecology (marine and terrestrial) and coastal processes of relevance to the preparation of the Development Scheme; and
- specialist advice, if requested from RCC and the EDQ, in relation to issues pertaining to ecology (marine and terrestrial) and coastal processes that may arise during the public notification phase of the Proposed Development Scheme.

1.3 PROJECT SCOPE

The project scope is to provide expert advice to inform all ecology (marine and terrestrial) and coastal processes considerations that need to be addressed and incorporated in the Structure Plan and, ultimately, the PDA Development Scheme. These aspects include:

1. The assessment of fauna and flora, the investigation of environmental constraints, and the assessment of options and strategies for the PDAs in relation to:
   - Matters of national environmental significance reflecting those protected under the Commonwealth *Environment Protection and Biodiversity*

Conservation Act 1999 relevant to Redland City;

- Matters of state environmental significance reflecting those natural values and areas protected under Queensland's environmental legislation relevant to Redland City, including (but not limited to) the *Nature Conservation Act 1992*, the *Marine Parks Act 2004*, the *Fisheries Act 1994*, the *Coastal Protection and Management Act 1995*, the *Vegetation Management Act 2009*, the *Environmental Protection Act 1994* and the *Environmental Protection (Water) Policy 2009*; and
- Matters of local environmental significance as defined by the Redlands Planning Scheme.

2. Determine and evaluate options for the sites that:
   - protect core ecological values in areas with important vegetation, biodiversity, waterways and wetlands;
   - enhance the ecological values of these areas by the provision of selected buffers and wildlife linkages ;
   - preserve important habitat and landscapes where deemed important; and
   - provide sport and recreation linkages.
3. Produce a report outlining the requirements to be incorporated into the Proposed Development Scheme.

1.4 STUDY AREAS

1.4.1 Toondah Harbour PDA

Toondah Harbour PDA is located on the southern shores of Moreton Bay in Cleveland, approximately 33 km east of the Brisbane city centre (**Figure 1.1a**). It is a recognised boat landing and acts as the point of departure and arrival for vehicular ferry and water taxi services between the mainland and North Stradbroke Island. The area is also comprised of residential and open space lands. The PDA covers landholdings located at Middle Street, Cleveland, and incorporates both land and sea areas with a total area of approximately 67 hectares (17.5 hectares over land, and 49.5 hectares within Moreton Bay).

Cleveland and its water transport facilities at Toondah Harbour are recognised as the main gateway to North Stradbroke Island. The harbour serves as the principal base for water taxi, passenger and vehicular ferry services to and from the island. The harbour is also utilised for the launch of recreational boats and trailers. Continuing growth of user numbers at Toondah Harbour will increase demand and place pressure on the existing small scale harbour facilities, which may have an impact on the environment.

1.4.2 Weinam Creek PDA

The Weinam Creek Marina is located at the intersection of Banana Street and Meissner Street in Redland Bay, approximately one hour drive south of the Brisbane city centre (**Figure 1.1b**). The bus stop/ferry interchange is an important item of community infrastructure, providing access for the island residents to shopping, health, education, employment and entertainment opportunities throughout Redland City and the greater Brisbane area. This facility links the southern Moreton Bay islands (Macleay, Lamb, Karragarra and Russell islands) with the mainland. This link also allows visitors and tourists to access the islands. Facilities at the marina include a jetty used by various commercial ferry operators servicing the Moreton Bay islands, recreation boat ramp facilities and long term parking areas for residents of the Moreton Bay islands to park their mainland vehicle. The existing bus stop is located within the marina car park adjacent to the jetty building and is configured as a linear stop with space for up to three buses. The surrounding area features a mix of urban development, which is predominantly suburban in character, with significant areas of coastal processes along the foreshore. These areas vary from walkway corridors and small picnic areas to large sporting areas. This foreshore open space presents significant views to Moreton Bay and the Southern Moreton Bay Islands. The PDA covers a total area of approximately 42 hectares (36.2 hectares over land, and 5.8 hectares within Moreton Bay).



Figure: 1.1a

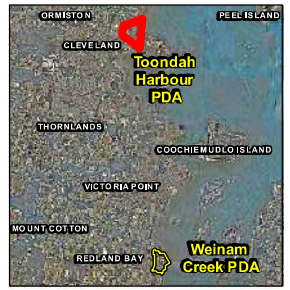
Title: Location of the Toondah Harbour Priority Development Area (PDA)

Project: **Ecological and Coastal Processes Advice: Toondah Harbour and Weinam Creek PDAs**

Client: **Redland City Council**

LEGEND

- PDA Boundary
- Suburbs



Notes: Contains data sourced from QLD Government and Redland City Council.
Regional Ecosystems data produced by BAAM Ecology.
Image sourced from Nearmaps 2013.

Coordinate System: GCS GDA 1994
Datum: GDA 1994
Units: Degree

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Date: 16/01/2014 Drawn By: MG Reviewed by: PL

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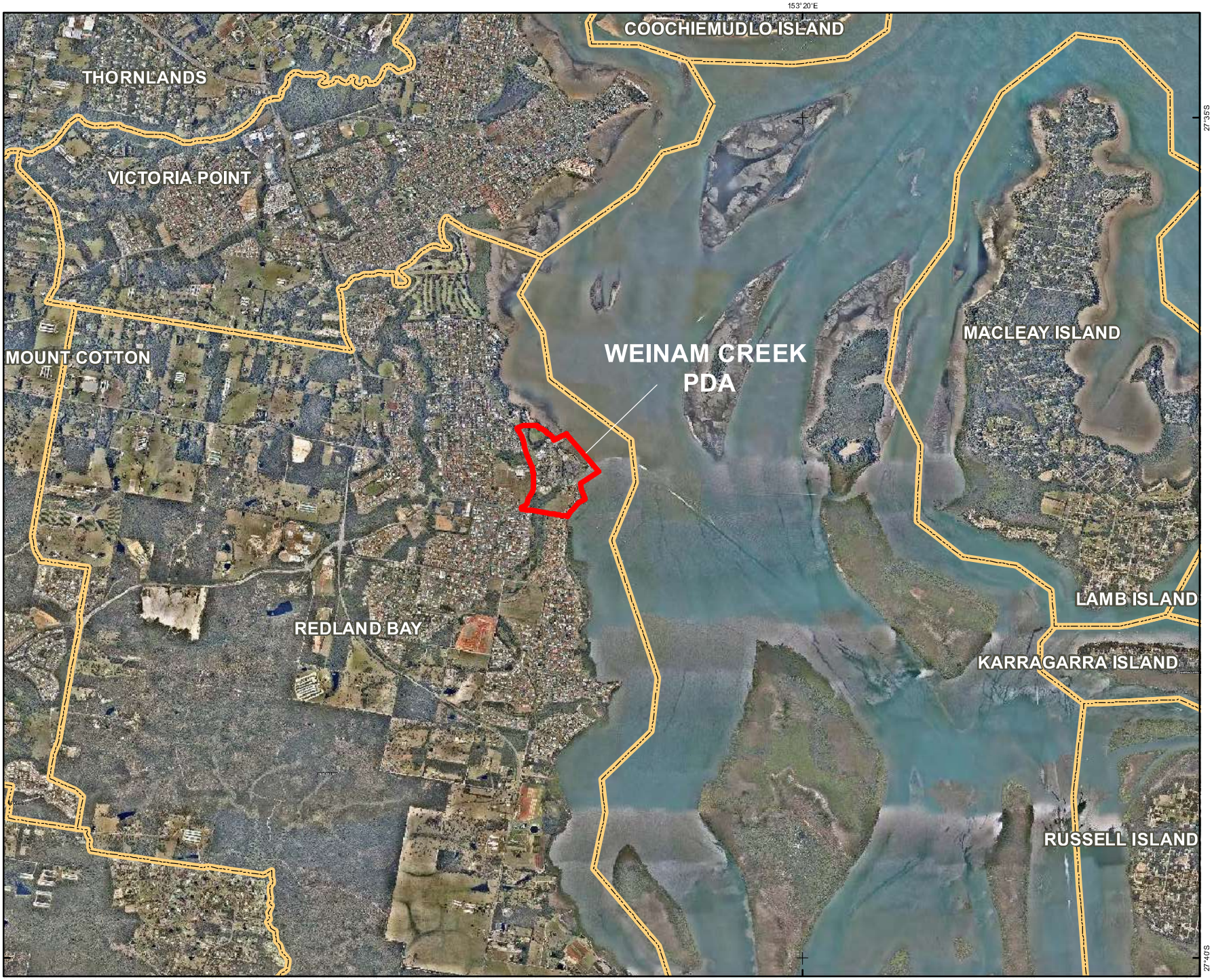


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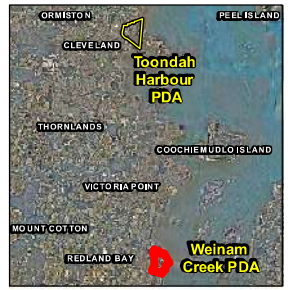
Title: Location of the Weinam Creek Priority Development Area (PDA)

Project: **Ecological and Coastal Processes Advice: Toondah Harbour and Weinam Creek PDAs**

Client: **Redland City Council**

LEGEND

- PDA Boundary
- Suburbs



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1.5 STATUTORY FRAMEWORK

Statutory instruments relevant to this ecological assessment cover Commonwealth, State and Local Government legislation and other instruments.

1.5.1 Commonwealth legislation

The Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects matters of national environmental significance (MNES), which include the following with potential relevance to the study areas:

- listed threatened species and ecological communities;
- migratory species protected under international agreements;
- Ramsar wetlands of international importance;
- the Commonwealth marine environment;
- World Heritage properties; and
- National Heritage places.

Should a project propose to take an action that will have, or is likely to have, a significant impact on a matter of national environmental significance, the proponent must refer that action to the Commonwealth Department of the Environment (DoE) for assessment as to whether the action is a 'controlled action' requiring Commonwealth approval for the project or proposed action. A 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts (DEWHA 2009a).

The Toondah Harbour PDA requires referral to the DoE with respect to a Wetland of International Importance, a Listed Threatened Ecological Community, 46 Listed threatened species and 64 Listed Migratory species of relevance to the EPBC Act (**Section 3.1**).

The Weinham Creek PDA requires referral with respect to a Wetland of International Importance, a Listed Threatened Ecological Community, 47 Listed threatened species and 64 Listed Migratory species of relevance to the EPBC Act (**Section 3.1**).

1.5.2 State legislation

Economic Development Act 2012

The *Economic Development Act 2012* (EDA) takes precedence over a number of the provisions given in the *Sustainable Planning Act* 2009, where the subject land is declared a Priority Development Area prior to an application being made.

Section 57 (5) of the EDA states that, in the making of a development scheme for a declared Priority Development Area, the Minister for Economic Development Queensland must consider requirements defined by a relevant planning instrument, or a plan, policy or code made under the Sustainable Planning Act 2009; however, the Minister is not bound to adhere to those requirements. BAAM makes no claims of expertise in the interpretation of the EDA and its relationship with the *Sustainable Planning Act* 2009.

Sustainable Planning Act 2009

The *Sustainable Planning Act 2009* (SPA) provides a framework to integrate planning and development assessment so that development and its effects are managed in a way that is ecologically sustainable, and for related purposes.

The SPA seeks to achieve ecological sustainability by:

- Managing the process by which development takes place;
- Managing the effects of development on the environment;
- Continuing the coordination and integration of planning at the local, regional and State levels.

Planning instruments produced under the SPA include:

- State Planning Regulatory Provisions;
- State Planning Policies;
- Regional Plans;
- Standard Planning Scheme Provisions;

- Structure Plans;
- Master Plans;
- Planning Schemes; and
- Local Planning Policies.

South East Qld Koala State Planning Regulatory Provisions

The *South East Qld Koala State Planning Regulatory Provisions* (KSPRP) regulate assessable development at the development assessment stage with mapping and associated codes. The KSPRP identifies the Koala Coast and Pine Rivers areas as '*priority Koala assessable development areas*' as Koala populations within these two areas are known to be under the most significant risk.

The KSPRP identifies and maps Koala habitat values under the following categories:

- bushland habitat (low, medium, high);
- suitable for rehabilitation (low, medium, high);
- other areas of value (low, medium, high); and
- generally not suitable.

The clearing of bushland habitat within a priority Koala assessable development area is prohibited.

State Planning Policy (December 2013)

While State Planning Policies do not bind development in PDAs they represent a reference point to guide planning and management issues the state considers important (UDLA 2012).

The new State Planning Policy (SPP) took effect on 2 December 2013, replacing the 10 former State planning policies.

The SPP defines the Queensland Government's policies about matters of state interest in land use planning and development. One of the identified state interests is Biodiversity, and one of the stated aims of the SPP is that matters of environmental significance are valued and protected, and the health and resilience of biodiversity is maintained or enhanced to support ecological integrity.

Biodiversity

One of the identified state interests is Biodiversity. A statutory requirement of the SPP is that matters of environmental significance are valued and protected, and the health and resilience of biodiversity is maintained or enhanced to support ecological integrity. This includes addressing matters of national, state and local environmental significance. Matters of national environmental significance are summarised above.

Matters of state environmental significance need to be identified, and developments should avoid significant adverse impacts on them. Ecological connectivity should be maintained, and in order of priority, developments should avoid, mitigate, and where applicable offset any residual adverse impacts.

Matters of state environmental significance include: protected areas; marine parks; declared fish habitat areas; essential habitat for wildlife listed as endangered or vulnerable, and the habitat for iconic species; regulated vegetation; wetlands of high ecological significance or in wetland protection areas; waters of High Ecological Value, wild rivers, and legally secured offset areas.

As with the former State Planning Policy 2/10 Koala Conservation in South East Queensland, the new SPP complements the KSPRP by informing future local government plan making, such as planning scheme amendments, and land-use planning decisions through structure plans, master plans, local area plans, community infrastructure designations and biodiversity development offset areas.

A key goal of the SPP and KSPRP is to contribute to the net increase in Koala bushland habitat in south-east Queensland and to assist in the long-term retention of viable Koala populations in the region. Achievement of this goal is assisted by the ***Offsets for Net Gain of Koala Habitat in South East Queensland Policy*** which provides a framework and direction for using environmental offsets to counterbalance unavoidable clearing of Koala habitat.

Coastal Environments

A statutory requirement of the SPP is that the coastal environment is protected and enhanced, while supporting opportunities for coastal-dependent development, compatible urban form and safe public access along the coast. Coastal-dependent development requires land adjoining the foreshore and access to tidal waters to function. Coastal resources include natural and physical features and landforms, vegetation, wildlife, quarry material, soil and water.

Water Quality

A statutory requirement of the SPP is that the environmental values and quality of Queensland Waters are protected and enhanced. The SPP addressed risks to water quality by informing planning and development assessment decisions aimed at helping to achieve water quality objectives in the Environmental Protection (Water) Policy 2009.

Natural Hazards are also identified as a key concern under the SPP, and include Coastal Hazards.

South East Queensland Regional Plan 2009-2031

The primary purpose of the *South East Queensland Regional Plan 2009-2031* (SEQRP) is to provide a sustainable growth management strategy for South East Queensland to the year 2031.

Regulatory provisions within the SEQRP trigger the need for certain developments to meet specific codes. The SEQRP categorises all land as one of three regional land use categories, which provide the spatial context for the regulatory provisions:

- Regional Landscape and Rural Production Area;
- Urban Footprint; and
- Rural Living Area.

Regulatory mapping is also provided for 'areas of ecological significance' and 'major Koala population and habitats'.

The SEQRP requires local government to prepare local nature conservation strategies that identify local biodiversity values, including terrestrial and aquatic biodiversity, ecological corridors and threatening processes. They also set local targets and performance indicators that have the capacity to be integrated with State reporting.

Nature Conservation Act 1992

The *Nature Conservation Act 1992* (NC Act) is the principal legislation for the conservation and management of the State's native flora and fauna and is administered by the Queensland Department of Environment and Heritage Protection (DEHP). The key goal of the NC Act is the protection of endangered, vulnerable and near threatened (EVNT) species of flora and fauna as listed under the *Nature Conservation (Wildlife) Regulation 1994*.

Under section 332 of the *Nature Conservation (Wildlife) Regulation 1994*, an approved species management program is required for tampering with an animal breeding place that is being used by a protected animal (including least concern native species) to incubate or rear the animal's offspring.

Under section 29 of the NC Act a licence, permit or authority (issued under the NC Act), or an exemption, is required to 'take' protected plants (currently including least concern native plants). The *Nature Conservation (Protected Plants) Conservation Plan 2000* (Conservation Plan) outlines how clearing permits, licences and exemptions can be issued to take protected plants.

The *Nature Conservation and Other Legislation Amendment and Repeal Regulation 2104* is currently under review and is likely to be finalised in early 2014. Key changes include implementing a risk-based approach for activities that pose a risk to endangered, vulnerable and near threatened plants.

Vegetation Management Act 1999

The purpose of the *Vegetation Management Act 1999* (VM Act) is to regulate the clearing of native remnant vegetation mapped as Endangered, Of Concern and Not of Concern Regional Ecosystems (REs) to maintain ecological processes, ensure there is no loss of biodiversity or increase in land degradation from vegetation clearing, and manage the effects of clearing. In addition, some areas of remnant vegetation are further classified as

Essential Habitat under the VM Act with specific reference to significant species listed under the NC Act.

At the time of writing, the regulation of State protected vegetation has very recently undergone a process of reform. One aspect of reform that is applicable to the PDAs is the de-regulation of the clearing of high-value regrowth on freehold and Indigenous land. Clearing activities that are exempt from the VM Act framework have also been revised.

Land Protection (Pest and Stock Route Management) Act 2002

The main purpose of the *Land Protection (Pest and Stock Route Management) Act 2002* (LP Act) legislation is to provide pest management for agricultural lands. The LP Act lists several species of flora and fauna that are considered Class 1, 2 or 3 pests under the Act, and for which landholders have certain obligations regarding their management.

Coastal Protection and Management Act 1995

The purpose of the *Coastal Protection and Management Act 1995* (CP Act) is to provide for the protection, conservation, rehabilitation and management of the coastal zone. Under section 54 of this Act, 'coastal management districts' can be declared over tidal wetlands, estuaries, mangrove areas, coastal streams, dune systems or declared key coastal sites. Both PDA sites contain land that falls within the coastal management district. Thereafter, under section 59 of the Act the chief executive of the Agency may issue a Coastal Protection Notice requiring certain action to be taken, or prohibiting a particular activity in a control district, which is likely to cause erosion, or have a significant effect on coastal management.

Fisheries Act 1994

The *Fisheries Act 1994* (Fisheries Act) and subordinate *Fisheries Regulations 2008* provide for the regulation of both commercial and recreational fisheries, and for the protection of endangered species and habitat critical to sustaining fish stocks. All waters of the state are protected against degradation by direct or indirect impact under section 125 of the Fisheries Act. Fish habitats are specifically protected through the designation of Fish Habitat Areas and the protection of marine plants as they provide substantial value to fisheries through provision of nursery habitat and nutrient cycling. The nearest designated Fish Habitat Area is more than 5 km from the Toondah Harbour PDA and more than 8 km from the Weinam Creek PDA.

All marine plants, including mangroves, seagrass and saltmarsh plants that grow on intertidal and subtidal lands are protected under Section 123 of the Fisheries Act. It is an offence to unlawfully remove, damage or destroy a marine plant, being a plant that usually grows on, or adjacent to tidal lands. A permit to undertake these activities may be obtained on application to the chief executive of the relevant agency.

Plants of highest significance to fisheries include plants that usually grow on tidal lands, including mangroves, seagrass, samphires, saltcouch and saltmarsh plants and marine algae (Couchman & Beumer 2007). Plants of high significance to fisheries also include plants that usually grow next to tidal land, including *Melaleuca* and *Casuarina* species; particularly where *Melaleuca* swamps next to tidal areas are either permanently or periodically tidally connected, and where *Casuarina* stands on the landward boundary of tidal flats have saltcouch or samphire communities growing underneath them (Couchman & Beumer 2007). Marine benthic algae are now also considered to be marine plants and are protected by the Fisheries Act.

Under Division 8 of the Fisheries Act, any waterway barrier that may impact fish movement within a waterway requires a permit. Waterway barriers include solid barriers, such as dams and weirs, which block a waterway to stop the flow of water as well as other barriers, such as causeways and culverts, which may physically inhibit fish movement. A waterway barrier permit may be required to construct works over waterways for the Proposed Development Scheme.

All works involving state resources require consent from the State government, prior to submitting a development application. Fisheries Queensland provides consent for the use of state fisheries resources through a Resource Allocation Authority (RAA). Applications for RAAs involving fisheries resources are made directly to Queensland Fisheries.

Marine Parks Act 2004

The purpose of the *Marine Parks Act 1994* is to provide for the conservation of the marine environment.

Moreton Bay Marine Park was declared in 1993 and extended in 1997 to cover most of Moreton Bay's tidal lands and tidal waters seawards to the limit of Queensland waters.

The Park is divided into five management zones:

- General Use Zones
- Habitat Protection Zones
- Conservation Zones
- Buffer Zones
- Protection Zones

Each zone has objectives defining the specific activities that are either allowed, require permits, or are prohibited. In addition, there are six designated areas, which protect ocean beaches, allow shipping operations or conserve marine mammals and reptile populations.

The PDA includes areas of water within a Habitat Protection Zone and General Use Zone of Moreton Bay Marine Park and therefore any development proposed within these areas will require assessment and approval under the *Marine Parks Act 2004*.

Projects that require major works within the marine park that are inconsistent with the intent of the marine park zone, but that are necessary for the public benefit, may be established as works areas within the marine park. Major works are defined in the Marine Parks Act and include port and harbour works, including developmental dredging of a navigation channel or boat harbour. A work area may only be established in a General Use or Habitat Protection Zone and will require ministerial approval based on consideration of a number of requirements, including, public notice of the activity and an assessment of the social, cultural, financial and environmental outcomes of the proposed development area. It will also require an analysis of the potential impacts associated with the development and a description of the mitigation and management options used to avoid, minimise or offset impacts.

Proposals incorporating major works that are likely to have a significant impact on the marine park require the declaration of a designated ['works area' prior to assessment and approval.

The Department of National Parks, Recreation, Sport and Racing (DNPRSR) will work with RCC, government agencies, potential developers and other organisations, as required, to develop strategies that facilitate the development assessment process while protection the marine park. In particular, DNPRSR will liaise with stakeholders to develop a strategy to declare a 'works area' and to protect and enhance the marine environment.

Further investigations into the social, cultural and financial outcomes are required to assess the full detail of the impacts and to develop effective mitigation measures in order to secure declared 'works areas'.

1.5.3 Redlands Planning Scheme 2006

The purpose of the Redlands Planning Scheme (Planning Scheme) is to provide a framework for managing development in a way that advances the purposes of the *Sustainable Planning Act 2009.*

Ecological sustainability is managed through six 'Desired Environmental Outcomes'; No. 1 of which aims to ensure development:

a) protects and enhances natural ecosystems, remnant ecosystems, waterways, Koala habitat and locally significant patches, corridors and mosaics of bushland that support wildlife;

b) maintains the health of the City's natural drainage systems, water catchments and Moreton Bay;

c) comprehensively assesses and effectively manages the individual and cumulative and direct and indirect impacts on environmental values;

d) manages wastes, emissions and pollution sources; and

e) minimises the adverse impacts of natural hazards.

The strategic framework of the Planning Scheme provides a summary of city-wide and local strategies to achieve the desired

environmental outcomes and describes the context for strategies and measures used to secure their implementation.

The Planning Scheme divides the planning area into 24 zones, including the Conservation Zone, and overlays are used to further define preferred development outcomes. The Planning Scheme identifies development that is exempt, self-assessable and assessable and provides Specific Outcomes by which code or impact assessable developments are assessed. Probable solutions and Acceptable solutions are provided within the Planning Scheme to achieve Specific Outcomes.

2.0 PROJECT APPROACH AND METHODS

In accordance with the terms of reference for the project, a staged approach to the delivery of the required outputs through each of four stages outlined below was adopted.

2.1 STAGE 1 – PROJECT INCEPTION AND MOBILISATION

Two terrestrial ecologists from BAAM and two marine ecologists from frc environmental attended a project inception meeting with EDQ, RCC and other consultants involved in the project on 2nd July 2013, where the scope of works for the consultancy was confirmed and background information on possible development options for each of the PDAs was provided.

2.2 STAGE 2 – TECHNICAL INVESTIGATION AND ANALYSIS, GENERATION OF DRAFT OPTIONS

2.2.1 Literature Review

Available literature and data was reviewed to provide a description of the aquatic and terrestrial habitats and floral and faunal communities and species of the study areas. This included a review and searches of:

- reports provided at the project's inception;
- relevant previous surveys completed by frc environmental and BAAM;
- other published reports and literature;
- listed threatened aquatic and terrestrial species or ecological communities on the Commonwealth's EPBC Act online Protected Matters Search Tool database;
- the Queensland DEHP's Wildlife Online database;
- Queensland Museum records;
- data from Birds Australia and the Queensland Wader Study Group;
- the Queensland Herbarium's Herbrecs Database;
- the Queensland Government's Regional Ecosystem and Regrowth Mapping;
- the Queensland Government's Koala Habitat Mapping;
- the Queensland Government's Essential Habitat Mapping;
- data from the Ecosystem Health Monitoring Program (EHMP);
- the Queensland Government's Wetlands Mapping Program database and GIS datasets;
- the DAFF Coastal Habitat Resources Information System;
- the presence of habitat for species of local significance as listed in the Redlands Planning Scheme;
- foreshores, wetlands and major and minor waterways listed in the Redlands Planning Scheme;
- Moreton Bay Marine Park Zoning Plan;
- current and historic aerial imagery;
- Council reserves, and
- Council conservation priorities as set out in the Environmental Inventory Map Version 4.3.

This information provided the study team with details of: EVNT species; ecologically significant habitat and communities; habitat and communities particularly sensitive to disturbance (including those protected under Federal, State and local legislation and guidelines); and species and communities of scientific, educational, cultural and historical interest. The likely occurrence and distribution of exotic species was also determined.

The reliability and relevance of information sources were evaluated to identify key knowledge gaps. This informed the design of

focused field surveys to verify the information gathered during the desktop study, and to fill any information gaps.

2.2.2 Marine Ecology Field Surveys

Marine ecology field surveys were completed over three days between the 5th and 8th July, 2013 to assess the current condition, value and extent of marine and estuarine ecosystems in the Toondah Harbour and Weinam Creek PDAs. The surveys included ground-truthing of habitat mapping to:

- verify habitat boundaries using GPS;
- characterise habitats (including mangroves, seagrass, soft-sediment benthos and rocky reef) according to species composition and cover;
- estimate habitat quality and value using a qualitative assessment of parameters including abundance, species composition, percent cover, and presence and abundance of epiphytes and epifauna;
- obtain a photographic record of habitat types (including underwater videography); and
- observe coastal processes such as areas of siltation or erosion.

All surveys were completed in accordance with the relevant permits issued to frc environmental.

2.2.3 Terrestrial Ecology Field Surveys

The field surveys for both sites were undertaken by a team of three terrestrial ecologists in fine, sunny weather on 5th July 2013, and involved ground-truthing of existing habitat mapping, including:

- verification of RE mapping;
- assessment of the actual or likely presence of significant terrestrial species and associated habitat (Commonwealth, State and local species);
- verification of habitat boundaries (using GPS plotters) and characterisation of the quality, condition and connectivity of the habitats present; and
- obtaining a photographic record of each of the habitat types present.

A particular focus of the terrestrial fauna survey was surveying all non-juvenile habitat trees for Koala; i.e. a food tree of the *Eucalyptus*, *Corymbia*, *Melaleuca* or *Lophostemon* genera, or a preferred shelter species such as *Angophora* species, with a height of more than four metres, or a trunk with a circumference of more than 31.5 centimetres at 1.3 metres above the ground (DERM 2010). This involved identifying and taking a GPS point at each non-juvenile habitat tree (or group of clustered trees), estimating the tree height and searching the base of the tree for Koala scats as confirmation of recent Koala activity.

The timing of the project did not allow for a presence/absence survey of migratory shorebirds, as most migratory shorebirds are absent from Australia during the austral winter. However, the survey was able to determine if suitable habitat for migratory shorebirds is present; therefore local knowledge and data from existing sources was used to determine the significance of the foreshore environment for these species against the EPBC Act criteria.

2.2.4 Reporting and Contribution to Options

Once the desktop study and field surveys had been completed, the provision of advice on ecology (marine and terrestrial) and coastal processes to inform the preparation of the Structure Plan and PDA Proposed Development Scheme proceeded along the following steps in accordance with the terms of reference for the project:

- a short briefing paper was prepared to inform attendees of an Options Development Workshop (Workshop 1) of the key strategic issues that should be considered in relation to ecological values and coastal ecology and processes;
- Adrian Caneris (Principal Wildlife Expert, BAAM), John Thorogood (Managing Principal, frc environmental) and Dr Simon Walker (Senior Ecologist, frc environmental) attended Workshop 1, which developed draft structure planning options for the PDAs.

2.3 STAGE 3 – SCENARIO DEVELOPMENT, TESTING AND DEVELOPMENT OF PREFERRED SCENARIO

The draft structure planning options for the PDAs, developed as an outcome of Workshop 1, were reviewed to inform:

- the preparation of a second, short briefing paper covering data, approaches and preliminary maps to inform attendees of a second Options Development Workshop (Workshop 2). This allowed attendees of Workshop 2 to gain an appreciation of the options to be considered and gain an appreciation of how these relate to coastal issues;
- attendance at Workshop 2 to assist in the development of a draft structure plan and provide attendees on the day with direction and creative ideas that translate the issues findings to options being considered; and
- consider appropriate planning and development controls to provide solutions for the preferred structure plan arising out of the workshop.

2.4 STAGE 4 – DRAFT DEVELOPMENT SCHEME AND INFRASTRUCTURE PLAN

The assessment and discussions held as part of the options assessment within the prior stages and specifically the refinement workshop resulted in the identification of preferred Options for the Toondah and Weinam Creek PDA's

The refinement workshop resulted in the identification of preferred options for the PDA's being (Option 2) for the Toondah Harbour PDA structure plan which focused on an urban harbour with a reduced marina (300-400 berths) as central feature of development. The Weinam Creek PDA structure plan focuses on new centre with opportunity for a 300-400 berth marina

Following the selection of the preferred options, a number of elements and items to refine the structure plan were reviewed and key items identified which included providing input into finalising the agreed structure plan and supporting strategies and input into the development of the ecological components of the Proposed Development Scheme.

3.0 EXISTING ENVIRONMENT

This section below describes the existing ecological values within each PDA as defined by the application of Federal, State and local statutes.

3.1 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Any actions that are likely to have a significant impact on a Matter of National Environmental Significance are subject to assessment under the Commonwealth's EPBC Act approval process. Matters of National Environmental Significance that are relevant to the Toondah Harbour and Weinam Creek PDAs have been summarised in **Table 3.1**.

Table 3.1 Matters of National Environmental Significance that are relevant to Toondah Harbour and Weinam Creek PDAs.

Matter of National Environmental Significance	Toondah Harbour PDA	Weinam Creek PDA
World Heritage Properties	–	–
National Heritage Places	–	–
Wetlands of International Importance	1	1
Great Barrier Reef Marine Park	–	–
Commonwealth Marine Areas	–	–
Listed Threatened Ecological Communities	1	1
Listed Threatened Species	46	47
Listed Migratory Species	64	64

3.1.1 World Heritage Properties

No World Heritage Properties occur in either the Toondah Harbour PDA or Weinam Creek PDA (**Appendices 1** and **2**).

3.1.2 National Heritage Places

No National Heritage Places occur in either the Toondah Harbour PDA or Weinam Creek PDA (**Appendices 1** and **2**).

3.1.3 Wetlands of International Importance

Both the Toondah Harbour PDA and Weinam Creek PDA are identified as occurring within the bounds of the Moreton Bay Wetland of International Importance, listed under the *Convention on Wetlands of International Importance 1971* (Ramsar Convention)

(**Appendices 1** and **2**). In the Toondah Harbour PDA, the existing channel of the harbour and some intertidal areas immediately adjoining the channel are mapped as being outside of the Ramsar area (**Figure 3.1**). Similarly, in the Weinam Creek PDA, the existing channel accessing the harbour is mapped as being outside of the Ramsar area (**Figure 3.2**).

The Moreton Bay Ramsar site wetlands are nationally and internationally significant as one of the largest estuarine bays in Australia, enclosed by barrier islands of vegetated dunes, which together with the permanent lakes of the sand island components provide a diverse and rich suite of wetland habitats. The wetlands are particularly significant as habitat for Dugong (*Dugong dugon*) and wetland birds, particularly migratory shorebirds. Moreton Bay also supports large numbers of the nationally threatened Green Turtle, Hawksbill Turtle and Loggerhead Turtle. Other nationally threatened species that the site supports are the Oxleyan Pygmy Perch, Honey Blue-eye and Water Mouse. The site is ranked among the top ten habitats in Queensland for the internationally vulnerable Dugong (DSEWPaC 2013a,b).

An action that will, or is likely to, have a significant impact on a Ramsar wetland will be subject to assessment and approval under the EPBC Act.

Moreton Bay is internationally significant for waterbirds, particularly migratory shorebirds (see **Section 3.1.5**), regularly supporting more than 50,000 waterbirds.

Toondah Harbour PDA

Based on the results of the field survey, the habitats within the Moreton Bay Ramsar Wetland in the Toondah Harbour PDA were of varying quality and include:

- saltmarsh;
- intertidal mud and sand flats;
- mangrove forests; and

intertidal seagrass (**Figure 3.6**).A small area of saltmarsh, which is listed as an endangered ecological community under the EPBC Act (Section 3.1.4) was recorded in the south-western corner of the section of the PDA. This saltmarsh was of moderate to low habitat quality. There was a larger area of saltmarsh south of the boundary of the PDA that was of moderate quality.

The intertidal mud and sand flats in the PDA provided low value foraging habitat for migratory shorebirds, and had a relatively high cover of rubble and shells.

Mangroves in the northern section of the PDA provided moderate habitat value; mangroves in the southern section of the PDA were of higher value and are to be retained under the proposed plan.

Intertidal seagrass beds were extensive, particularly in the northern section of the PDA, and provided moderate to high value foraging habitat for migratory shorebirds, except along the fringes of the dredged shipping channel, where the value was low. Seagrass beds are also known to be important foraging areas for turtles and nursery areas for fish.

Overall, the wetlands in the Toondah Harbour PDA provide moderate value habitat for migratory shorebirds (see Appendix 1 for further details).



Figure: 3.1

Title: Matters of National Environmental Significance within Toondah Harbour PDA

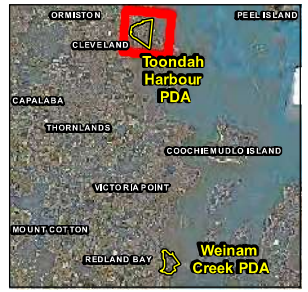
Project: **Ecological and Coastal Processes Advice: Toondah Harbour and Weinam Creek PDAs**

Client: **Redland City Council**

LEGEND

Koala Food Trees:

- Primary
- Secondary
- Other
- Seagrass
- Migratory Shorebird Foraging Habitat
- Migratory Shorebird Roost Sites
- Subtropical & Temperate Coastal Saltmarsh
- Ramsar Area
- PDA Boundary



Notes: Contains data sourced from QLD Government, Image sourced from Nearmaps 2013

Coordinate System: GCS GDA 1994
Datum: GDA 1994
Units: Degree

1:7,000 at A3

0 50 100 200 Meters

Date: 18/12/2013 Drawn By: MG Reviewed by: JA

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Figure: 3.2

Title: Matters of National Environmental Significance within Weinam Creek PDA

Project: **Ecological and Coastal Processes Advice: Toondah Harbour and Weinam Creek PDAs**

Client: **Redland City Council**

LEGEND

Koala Food Trees:

- Primary
- Secondary
- Other

Habitat

- Seagrass
- Flying Fox Camp
- Potential Ilidges' Ant Blue Butterfly
- RE 12.1.2 - Potential Subtropical & Temperate Coastal Saltmarsh ecological community
- Ramsar Area
- PDA Boundary



Notes: Contains data sourced from QLD Government and Redland City Council.
Regional Ecosystems data produced by BAAM Ecology.
Image sourced from Nearmaps 2013.

Coordinate System: GCS GDA 1994
Datum: GDA 1994
Units: Degree

1:4,740 at A3

0 0.020.04 0.08 0.12 0.16 Kilometers

Date: 18/12/2013 Drawn By: MG Reviewed by: PL

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Weinam Creek PDA

Based on the results of the field survey, the habitats within in the Moreton Bay Ramsar Wetland in the Weinam Creek PDA were recorded as having moderate to low quality, and were comprised of predominantly:

- intertidal mud and sand flats; and
- mangrove forest (**Figure 3.7**).

Seagrass beds of low to moderate value were also present just outside of the northern section of the PDA; they were of lesser value as foraging habitat relative to seagrass beds on the eastern side of Moreton Bay within the Moreton Bay Ramsar Wetland. A saltmarsh community of moderate to high value was present within the southern boundary of the PDA; however, this area was outside of the Moreton Bay Ramsar Wetland.

The intertidal mud and sand flat areas in the Moreton Bay Ramsar Wetland had a relatively high cover of rubble and shells and provided low value foraging habitat for shorebirds, relative to habitats further north and south of the PDA.

Mangroves within the Moreton Bay Ramsar Wetland were also of low to moderate value, and were relatively sparse. Mangrove forests in Weinam Creek in the southern section of the PDA were of higher value; however, they were outside the boundary of the Moreton Bay Ramsar Wetland.

Overall, the wetlands in the Weinam Creek PDA provide low habitat value for migratory shorebirds.

Listed Threatened Species and Ecological Communities

The desktop assessment identified 35 and 39 EPBC-listed threatened species as having potential to occur in the Toondah Harbour and Weinam Creek PDA study areas, respectively (**Appendices 1** and **2**). It should be noted that the EPBC Online Protected Matters Search Tool, whilst based on some species records, relies on modelling of suitable habitats and is largely predictive.

Appendix 3 lists all significant species obtained from the database searches and indicates the likelihood of their occurrence in the PDAs, given the habitats available. **Table 3.2** summarises those EPBC-listed threatened species that are known or are considered likely to occur in either of the Toondah Harbour or Weinam Creek PDAs. Definitions for likelihood of occurrence used throughout this document are:

Known – confirmed presence onsite.
Likely to occur –there were both local records and suitable habitat for the species; means 'high potential' or good habitat is present but no species were observed onsite.
Potential to occur – either suitable habitat or local records were present; means 'low potential' or habitat for species is not definitive.
Unlikely to occur – no suitable habitat present and/or the site is outside of the known range of the species.

Table 3.2 Species listed as threatened or migratory species under the EPBC Act that are known or are considered likely or to have potential to occur in either of the PDAs.

Species	Common name	EPBC	NCA	Toondah	Weinam
Threatened species					
Phascolarctos cinereus	Koala (SEQ Bioregion)	V	V	Known	Known
Pteropus poliocephalus	Grey-headed Flying-fox	V	C	Likely	Known
Caretta caretta	Loggerhead Turtle	E,M	E	Potential	Potential
Chelonia mydas	Green Turtle	V,M	V	Likely	Likely
Eretmochelys imbricata	Hawksbill Turtle	V,M	V	Potential	Potential
Migratory shorebirds					
Pluvialis fulva	Pacific Golden Plover	M	S	Likely	Potential
Pluvialis squatarola	Grey Plover	M	S	Potential	Potential
Charadrius bicincutus	Double-banded Plover	M	S	Likely	Potential
Charadrius mongolus	Lesser Sand Plover	M	S	Likely	Potential
Charadrius leschenaultii	Greater Sand Plover	M	S	Likely	Potential
Gallinago hardwickii	Latham's Snipe	M	S	Unlikely	Potential

Species	Common name	EPBC	NCA	Toondah	Weinam
Limosa lapponica	Bar-tailed Godwit	M	S	Likely	Unlikely
Numenius phaeopus	Whimbrel	M	S	Known	Likely
Numenius madagascariensis	Eastern Curlew	M	NT	Known	Potential
Tringa nebularia	Common Greenshank	M	S	Likely	Unlikely
Xenus cinereus	Terek Sandpiper	M	S	Likely	Unlikely
Actitis hypoleucos	Common Sandpiper	M	S	Likely	Potential
Tringa brevipes	Grey-tailed Tattler	M	S	Known	Likely
Arenaria interpres	Ruddy Turnstone	M	S	Likely	Potential
Calidris tenuirostris	Great Knot	M	S	Likely	Potential
Calidris canutus	Red Knot	M	S	Likely	Potential
Calidris ruficollis	Red-necked Stint	M	S	Known	Potential
Calidris acuminata	Sharp-tailed Sandpiper	M	S	Potential	Potential
Calidris ferruginea	Curlew Sandpiper	M	S	Likely	Potential
Other migratory species					
Ardea ibis	Cattle Egret	M	S	Unlikely	Potential
Ardea modesta	Great Egret	M	S	Known	Likely
Egretta sacra	Eastern Reef Egret	M	S	Known	Likely
Pandion cristatus	Eastern Osprey	M	S	Known	Likely
Haliaeetus leucogaster	White-bellied Sea-Eagle	M	S	Likely	Likely
Limosa limosa	Black-tailed Godwit	M	S	Potential	Unlikely
Tringa stagnatilis	Marsh Sandpiper	M	S	Potential	Unlikely
Limicola falcinellus	Broad-billed Sandpiper	M	S	Potential	Unlikely
Hydroprogne caspia	Caspian Tern	M	S	Likely	Known
Thalasseus bengalensis	Lesser Crested Tern	M	S	Potential	Potential
Thallaseus bergii	Crested Tern	M	S	Likely	Likely
Sternula albifrons	Little Tern	M	E	Likely	Likely
Chlidonias leucopterus	White-winged Black Tern	M	S	Potential	Potential
Hirundapus caudacutus	White-throated Needletail	M	S	Likely	Likely
Apus pacificus	Fork-tailed Swift	M	S	Potential	Potential
Merops ornatus	Rainbow Bee-eater	M	S	Likely	Likely
Rhipidura rufifrons	Rufous Fantail	M	S	Unlikely	Likely
Monarcha melanopsis	Black-faced Monarch	M	S	Unlikely	Likely
Myiagra cyanoleuca	Satin Flycatcher	M	S	Potential	Potential
Dugong dugon	Dugong	M	V	Likely	Potential

Abbreviations: EPBC = Status under Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*; NCA = Status under Queensland *Nature Conservation Act 1992*; E=Endangered; V=Vulnerable; M=Migratory; NT=Near Threatened; C= Least Concern; S=Special Least Concern (Migratory).

Toondah Harbour PDA

Marine Mammals:

The humpback whale (*Megaptera novaeangliae*) is the only marine mammal listed as vulnerable under the EPBC Act that is commonly reported from within the relatively open central and northern waters of Moreton Bay. Humpback whales are unlikely to occur in the vicinity of the Toondah Harbour PDA due to lack of suitable habitat.

Marine Reptiles:

All of Australia's six species of marine turtles occur in Moreton Bay (Couper 1998); however only three species of marine turtle (loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*), and hawksbill turtle, (*Eretmochelys imbricata*)) are likely occur in the subtidal and intertidal areas adjacent to the Toondah Harbour PDA. Only sub-adult and adult green turtles are likely to commonly occur in and adjacent to the PDA.

Green turtles feed extensively on seagrass; particularly on beds dominated by *Halophila ovalis*, *Halophila spinulosa* and *Halodule uninervis* and may also feed on the fallen fruit of the grey mangrove, *Avicennia marina* and algae (Limpus 1998). Foraging habitat for marine turtles (particularly green turtles) occurs in and adjoining the Toondah Harbour PDA. In Moreton Bay, green turtles are known to spend large portions of time in shallow subtidal habitats (depths less than 3 m), including dredged channels (Hazal, Lawler & Hamann 2009). These habitats coincide with the shallow margins of the Toondah Harbour PDA.

Terrestrial Fauna:

Based on the results of the field survey and consideration of the likelihood of occurrence (**Appendix 3**), one EPBC-listed threatened terrestrial fauna species is known to occur, namely Koala (*Phascolarctos cinereus*; EPBC Act: Vulnerable; NC Act: Vulnerable (SEQ Bioregion)), and one further listed threatened species, namely Grey-headed Flying-fox (*Pteropus poliocephalus*; EPBC Act: Vulnerable) is likely to occur (**Table 3.2**).

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- lead to a long-term decrease in the size of an important population of a species;
- reduce the area of occupancy of an important population;
- fragment an existing important population into two or more populations;
- adversely affect habitat critical to the survival of a species;
- disrupt the breeding cycle of an important population;
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;
- introduce disease that may cause the species to decline; or
- interfere substantially with the recovery of the species (DEWHA 2009a).

Koala: The field survey identified a total of 286 habitat trees important for Koala are scattered across the western portion of the PDA as a component of the urban environment (**Figure 3.1**). Koala scats were observed under 33 of these trees, confirming recent Koala use of trees in the PDA, but no Koala was observed. Observations of Koala in the trees within the PDA, together with the high frequency of Koala scats observed under suitable food trees across the PDA during the field survey, indicates these trees support at least several individuals of the local urban Koala population whose home ranges incorporate portions of the PDA. These Koalas are known to move regularly through the western portion of the PDA, visiting favoured food trees. Other important food trees these Koalas will be visiting include larger patches of suitable habitat along the foreshore immediately south of the PDA boundary, and scattered food trees in the urban footprint to the west of the PDA. There is a very limited occurrence of Koala food trees north of the PDA.

There is no bushland habitat within the PDA, therefore there is no 'habitat critical to the survival' of Koala, as defined in the interim referral advice (DSEWPaC 2012), present within the PDA.

The mainland portion of Redland City occurs within a region known as the Koala Coast, which also incorporates the eastern portion of Logan City and the south-eastern portion of Brisbane City. The Koala population of the Koala Coast is regarded nationally as one of the most significant Koala populations because of its relatively large population density and size and the identified genetic distinctiveness of Koalas in this population compared with other Koalas in South East Queensland (Lee *et al*. 2010, DERM 2012). This population can therefore be regarded as an 'important population' under the EPBC Act (DEWHA 2009a).

Development should ensure no net loss of Koala habitat trees, particularly primary food trees available to the local Koala population, no net increase in Koala mortality, particularly from vehicle strike, and maintenance of safe movement opportunities for Koala to move between food tree resources retained within the urban environment.

Final design should incorporate tree retention wherever possible and be undertaken in accordance with PDA Practice Note No.6 (http://www.dsdip.qld.gov.au/resources/guideline/pda/practice-note-06-tree-retention.pdf) The practice notes are provided to complement the draft PDA Development Scheme and guidelines.

Grey-headed Flying-fox: Grey-headed Flying-fox is likely to occur as a regular visitor to flowering trees; however no flying-fox camp occurs within or immediately adjoining the PDA. Given the relatively small quantity of potential food trees in the PDA and the abundant availability of such trees in the region, the project is unlikely to have a significant impact on this species.

Furthermore, any offset plantings for Koala (see **Section 4.1**) will also benefit Grey-headed Flying-fox.

No other threatened terrestrial fauna species are considered likely to occur (**Appendix 3**).

Threatened Flora: No terrestrial flora species listed as endangered or vulnerable under the EPBC Act are known from or considered likely to occur in the Toondah Harbour PDA.

Threatened Ecological Communities: No threatened ecological communities were identified from the database search results as having potential to occur within the Toondah Harbour PDA (**Appendix 1**). However, the field survey identified a small patch of Subtropical Coastal Saltmarsh ecological community, which equates to RE 12.1.2 and occurs within the south-western corner of the Toondah Harbour PDA (**Figure 3.1**). Nomination of Subtropical and Temperate Coastal Saltmarsh as an endangered ecological community under the EPBC Act has been accepted. While assessment for eligibility and listing was due for completion by 30 June 2013 (TSSC 2013), the assessment outcome has yet to be made public. In the first instance, impacts on this community should be avoided where possible. When this community becomes officially listed as a threatened ecological community, then actions that may have negative impacts on this community will require referral to the Commonwealth and offsets may be required.

Weinam Creek PDA

Marine Mammals:

Humpback whales, listed as vulnerable under the EPBC Act, are the only whale species commonly reported from within the relatively open central and northern waters of Moreton Bay. This species is unlikely to occur in the vicinity of the Weinam Creek PDA due to a lack of suitable habitat.

No other marine mammals listed as threatened are likely to occur in the vicinity of the Weinam Creek PDA.

Marine Reptiles:

All of Australia's six species of marine turtles occur in Moreton Bay (Couper 1998); however only three species of marine turtle (loggerhead turtle, green turtle and hawksbill turtle) may occur in the subtidal and intertidal areas adjacent to the Weinam Creek PDA. Only sub-adult and adult green turtles are likely to commonly occur in and adjacent to the PDA.

Foraging habitat for marine turtles occurs in and adjoining the Weinam Creek PDA; however, it is of relatively low quality.

Terrestrial Fauna:

Based on the results of the field survey and consideration of the likelihood of occurrence (**Appendix 4**), two listed threatened terrestrial fauna species are known to occur within the Weinam Creek PDA, namely Koala (*Phascolarctos cinereus*; EPBC Act: Vulnerable; NC Act: Vulnerable (SEQ Bioregion)) and Grey-headed Flying Fox (*Pteropus poliocephalus*; EPBC Act: Vulnerable) (**Table 3.2**).

Koala: 196 habitat trees important for Koala are scattered across much of the land portions of the PDA as a component of the urban environment (**Figure 3.2**). However, the field survey located Koala scats under only a single tree surveyed and tree-trunk scratches consistent with Koala were generally lacking on most smooth-barked trees, indicating that Koalas visit suitable food trees in the PDA very infrequently. There is no remnant eucalypt woodland habitat within the PDA, therefore there is no 'habitat critical to the survival' of Koala, as defined in the interim referral advice (DSEWPaC 2012), present within the PDA. More suitable habitats for Koala occur along Moogurrapum Creek approximately 1 km to the west of the PDA, and within a minor corridor along Weinam Creek to the south of the PDA. Koala food trees within the PDA are therefore considered of marginal value to the local Koala population.

Grey-headed Flying-fox: A flying-fox roosting camp currently exists in the Weinam Creek swamp (**Figure 3.2**), primarily on the northern side of Moore's Road, but occasionally spilling over to the southern side of Moore's Road when very large numbers of flying-foxes are present. This is one of the main flying-fox roost sites in Redland City and is used seasonally by up to several thousand Grey-headed Flying-fox for mating, birthing and as a maternity camp (**Figure 3.3**).

Threatened Flora: No terrestrial flora species listed as endangered or vulnerable under the EPBC Act is known from the Weinam Creek PDA. One species, Lesser Swamp Orchid (*Phaius australis*; EPBC Act: Endangered), has potential to occur in the southern portion of the PDA, in association with *Melaleuca quinquenervia* forest RE12.3.5; however, this species was not located during the field survey and is considered unlikely to occur.

Threatened Ecological Communities: No threatened ecological communities were identified from the database search results as having potential to occur (**Appendix 2**). Two small patches of RE 12.1.2, which may equate to the Subtropical and Temperate Coastal Saltmarsh ecological community (nominated for listing but not yet publically listed), were mapped within or adjoining the Weinam Creek swamp (**Figure 3.2**). However, these patches could not be accessed (due to constraints on accessing private land) to ground-truth whether they meet the condition and size criteria for inclusion in the community (TSSC 2013). Until such time that a full assessment can be made, impacts on this community should be avoided where possible as actions that may have negative impacts on this community may require referral to the Commonwealth and offsets may be required.

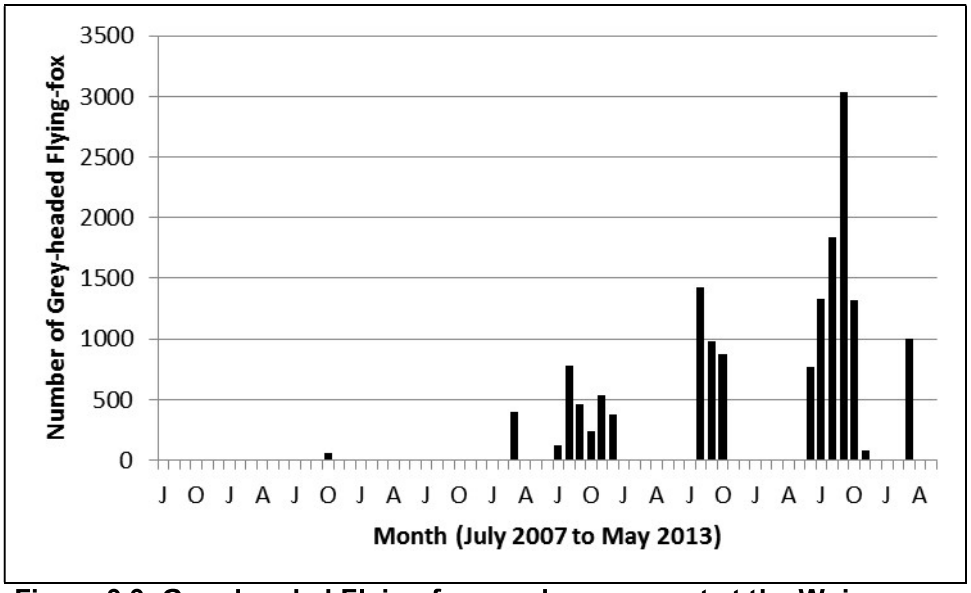


Figure 3.3. Grey-headed Flying-fox numbers present at the Weinam Creek flying-fox camp over the period July 2007 to May 2013 (Source of count data: Queensland Department of Environment and Heritage Protection).

3.1.4 Listed migratory species

The desktop assessment identified 63 EPBC-listed threatened species as having potential to occur in each of the Toondah Harbour and Weinam Creek PDA study areas (**Appendices 1** and **2**). It should be noted that the EPBC Online Protected Matters Search Tool, whilst based on some species records, relies on modelling of suitable habitats and is largely predictive.

Appendix 3 and **4** lists all migratory species obtained from the database searches and indicates the likelihood of their occurrence in the PDAs, given the habitats available.

Based on the results of the field survey and consideration of the likelihood of occurrence based on the habitats present, there are migratory species known or considered likely or to have potential to occur in the PDA project areas, including 19 migratory shorebird species (**Table 3.2**).

The Moreton Bay Ramsar site is recognised as an internationally important migratory shorebird area and supports at least 40 species of shorebirds that use intertidal habitats in Moreton Bay, including 30 migratory shorebird species listed by international migratory bird conservation agreements (Clemens *et al*. 2008). Moreton Bay as a whole supports a maximum abundance of nearly 36,000 migratory shorebirds, including up to 3,500 Eastern Curlew (9% of the flyway population) and 3,100 Grey-tailed Tattler (6% of the flyway population) (Clemens *et al*. 2008). Due to its recognition as an internationally important migratory shorebird area, habitats utilised by migratory shorebirds in Moreton Bay are characterised as 'important habitat' for migratory shorebirds under the EPBC Act (DEWHA 2009b).

An action is likely to have a significant impact on migratory shorebirds should it lead to any of:

- loss of important habitat;
- degradation of important habitat leading to a substantial reduction in migratory shorebirds using the site;
- increased disturbance leading to a substantial reduction in migratory shorebirds using important habitat; or
- direct mortality of birds leading to a substantial reduction in migratory shorebirds using important habitat (DEWHA 2009b).

Toondah Harbour PDA

Migratory Shorebirds:

Habitat for migratory shorebirds within or adjoining the Toondah Harbour PDA includes intertidal mudflats and seagrass beds within and adjoining the PDA, mostly to the north-west of the harbour, and several known roost sites adjoining the PDA, notably a mangrove roost site to the east and a claypan roost site to the south (**Figure 3.1**). The intertidal seagrass beds have medium to high value as foraging habitat for migratory shorebirds, except along the fringes of the dredged shipping channel where the value is lower, and low value in the intertidal mudflat areas that the aquatic survey determined had relatively high rubble and shell cover.

These intertidal mudflats are likely used by small numbers of a variety of migratory shorebirds as foraging habitat. As these habitats fall within an internationally important site for migratory shorebirds, they are recognised as important habitat for migratory shorebirds under the EPBC Act. Any actions that negatively impact on migratory shorebird use of these habitats will require referral to the Commonwealth, and development approval may require substantial environmental offsets specific to migratory shorebirds, which could be completed as part of the redevelopment project. Incorporation of appropriate habitat buffers will also be an important consideration for limiting impacts, particularly disturbance impacts, on migratory shorebirds.

Several other migratory bird species occur or are likely to occur in the PDA (**Table 3.2**). However, the PDA does not support important habitat for any of these species, and project actions are unlikely to have a significant impact on any of these species.

Marine Mammals:

Several migratory cetacean species have been recorded in Moreton Bay including; humpback whale, Bryde's whale (*Balaenoptera edeni*), the Indo-Pacific hump-backed dolphin (*Sousa chinensis*), and the killer whale (*Orcinus orca*). Sightings of whales and dolphins are most commonly reported from within the relatively open central and northern waters of Moreton Bay. These species are unlikely to occur in the vicinity of the Toondah Harbour PDA due to lack of suitable habitat. The Indo-Pacific hump-backed dolphin may occasionally use these waters.

Dugong are also listed as migratory species. They are most often seen foraging on seagrass beds (Lanyon 2003). The distribution of seagrass is predominantly determined by penetration of light through the water column, which is highly affected by turbidity. In the western parts of Moreton Bay where turbidity is high, seagrass is restricted to shallower areas. However, two species of seagrass *Halophila spinulosa* and *Halophila ovalis* are recorded at depths up to 12 m on the eastern side of the bay and coincide with dugong distribution (Lanyon 2003). Six bi-monthly aerial surveys for dugong in Moreton Bay were undertaken in 1995, and confirmed that it supported a significant population of dugongs (Lanyon 2003). The bay was divided into 6 zones, with southern Moreton Bay being in zone 6, and with the highest known dugong population being in the eastern bay (zones 4 and 5) (Lanyon 2003). Only approximately 10% of the dugong sightings in Moreton Bay were in zone 6 (which includes the waters near the Toondah Harbour PDA). Most dugongs (80 – 98% of the total population) were found in zone 4 in association with the extensive seagrass beds of the 'eastern banks' of Moreton Bay (Lanyon 2003).

Shallow seagrass beds containing seagrass species consumed by dugong were recorded in the Toondah Harbour PDA, particularly in the north-eastern section of the PDA. Dugong are likely to use these areas for foraging; however, dugong are not likely to occur in large numbers due to the marginal nature of the seagrass habitat.

Marine Reptiles:

All of Australia's six species of marine turtles occur in Moreton Bay (Couper 1998); however only three species of marine turtle (loggerhead turtle, green turtle and hawksbill turtle) and are likely to occur in the subtidal and intertidal areas adjacent to the Toondah Harbour PDA. Only sub-adult and adult green turtles are likely to commonly occur in and adjacent to the PDA.

As discussed previously in Section 3.1.4, foraging habitat for marine turtles was recorded in and adjoining the Toondah Harbour PDA. In Moreton Bay, green turtles are known to spend large portions of time in

shallow subtidal habitats (depths less than 3 m), including dredged channels. These habitats coincide with the shallow margins of the Toondah Harbour PDA (Hazal, Lawler & Hamann 2009).

Weinam Creek PDA

Migratory Shorebirds:

Intertidal foreshore areas within the Weinam Creek PDA consist largely of bare rubble and sand, with a seagrass bed immediately north of the PDA boundary (**Figure 3.2**). Intertidal habitat within the PDA is of marginal value to migratory shorebirds due to the nature of the substrate and proximity to existing disturbance. Therefore, the intertidal habitats are likely to be used only infrequently by migratory shorebirds. Consequently, development within the PDA is unlikely to impact negatively on migratory shorebirds.

Several other migratory bird species occur or are likely to occur in the PDA (**Table 3.2**). However, the PDA does not support important habitat for any of these species, and project actions are unlikely to have a significant impact on any of these species.

Marine Mammals:

Several migratory cetacean species have been recorded in Moreton Bay; humpback whale, Bryde's whale, the Indo-Pacific hump-backed dolphin, and the killer whale. Sightings of whales and dolphins are most commonly reported from within the relatively open central and northern waters of Moreton Bay; similar to the Toondah Harbour PDA, these species are unlikely to occur in the vicinity of the Weinam Creek PDA due to lack of suitable habitat, with the exception of the Indo-Pacific hump-backed dolphin that is likely to occur in low abundance.

Similar to Toondah Harbour PDA, approximately 10% of the dugong sightings in Moreton Bay were in waters near the Weinam Creek PDA. As such, an even lower proportion of the dugong population would be expected to have occurred in the vicinity of the Weinam Creek PDA. Most dugongs (80 – 98% of the total population) were found in zone 4 in association with the extensive seagrass beds of the 'eastern banks' of Moreton Bay (Lanyon 2003).

More recently, Groom et al. (2004) completed dugong surveys around the southern Moreton Bay Islands (east of the Weinam Creek PDA) in relation to a study regarding the risk of dugongs to vessel strike in this area. Low numbers of dugong (10) were sighted during the 25 day boat-based survey. Most sightings were recorded in the region between Macleay, Russell, Karragarra and Garden islands (Groom *et al*. 2004). There was one sighting offshore of the Weinam Creek Marina Entrance Channel; however, no dugong feeding trails through seagrass beds were observed in the vicinity of the Weinam Creek PDA (Groom et al. 2004). The seagrass beds north the Weinam Creek PDA contain species that dugong are known to consume; however, are of relatively low to moderate value to dugong, due to the presence of a high proportion of rubble in the sediment, so individuals are unlikely to occur frequently.

Marine Reptiles:

Similar to the Toondah Harbour PDA, only three species of marine turtle (loggerhead turtle, green turtle and hawksbill turtle) may occur in the subtidal and intertidal areas adjacent to the Weinam Creek PDA. Only sub-adult and adult green turtles are likely to commonly occur in and adjacent to the PDA. Foraging habitat for marine turtles occurs in and adjoining the Weinam Creek PDA; however, it is of relatively low value.

3.1.5 Commonwealth marine environment

Commonwealth marine waters generally include the area from the edge of the state coastal waters (3 nautical miles) out to 200 nautical miles from the coast. Commonwealth marine areas are a Matter of National Environmental Significance under the EPBC Act. Marine Protected Areas that are Commonwealth reserves are also protected under the EPBC Act. The Toondah Harbour PDA and the Weinam Creek PDAs are located within state controlled coastal waters and do not fall within a designated Commonwealth Marine Area.

3.2 MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

Under the State Planning Policy both PDAs are mapped as supporting matters of state

environmental significance (**Figures 3.4** and **3.5**).

3.2.1 Protected Area Estates

Under the NC Act, Protected Area Estates include conservation parks and areas that are subject to international agreements. As such, the Moreton Bay Marine Park, being both a conservation park and a Ramsar wetland, is subject to the NC Act.

3.2.2 Marine Parks

Toondah Harbour and Weinam Creek each encompass estuarine, intertidal, marine and foreshore environments within the Moreton Bay Marine Park, which is subject to the provisions of the *Marine Parks Act* 2004 (Qld.). For major works such as dredging and harbour development to occur in the marine park, a 'works area' will need to be declared. This would include an assessment of the social, cultural, financial and environmental outcomes of the proposed development, including identification of adverse impacts and potential mitigation measures.

Further work is required to understand both the potential detrimental and beneficial impacts associated with the proposed development at Weinam Creek and Toondah Harbour, in order to designate areas within each PDA as a work area.

Harbour developments can increase employment in the marine construction industry; provide direct or indirect employment to support marine and ancillary services; and provide support to the community through investment in local organisations and improvements to community infrastructure. Beneficial environmental outcomes of the proposed development of Weinam Creek and Toondah Harbour may include:

- consolidation of coastal development in the Marine Park;
- increasing the availability of marina berths and decreasing the number of boats on swing moorings, which damage seagrass beds;
- preservation of existing remnant coastal wetlands with high ecological significance where possible, particularly to the south of the existing Toondah Harbour development and in Weinam Creek;
- establishment and enhancement of mangrove areas behind southern seawalls at Toondah Harbour;
- additional hard substrate and structures for colonisation by a range of different marine organisms; and
- offsetting the loss of marine plants.

The Proposed Development Scheme has sought to minimise impacts to the environmental values of the Marine Park, within and surrounding the PDAs, through consideration of appropriate mitigation methods and biodiversity offsets (refer to **Section 1.5.2** of this report).

3.2.3 Marine Plants and Declared Fish Habitat Areas

Toondah Harbour PDA

There is no designated Fish Habitat Area in the vicinity of the Toondah Harbour PDA. The closest declared Fish Habitat Area is approximately 5 km away, and is not likely to be affected by development of the PDA. However, there are areas of marine plants within the Toondah Harbour PDA, particularly mangroves and seagrass, which have moderate to high fisheries value, based on the habitat structure, condition and presence of particular species. These areas have largely been preserved in the Proposed Development Scheme.

Weinam Creek PDA

There is no declared Fish Habitat Area in the vicinity of the Weinam Creek PDA. The closest Fish Habitat Area is approximately 8 km away, and is not likely to be affected by development of the PDA. However, there are areas of marine plants within the Weinam Creek PDA, particularly mangroves and seagrass, which are of low to moderate fisheries value that may be affected under the Proposed Development Scheme. Areas of moderate fisheries value in Weinam Creek have largely been preserved in the Proposed Development Scheme.



Figure: 3.4

Title: State Planning Policy Matters of State Environmental Significance Toondah Harbour PDA

Project: **Ecological and Coastal Processes Advice: Toondah Harbour and Weinam Creek PDAs**

Client: **Redland City Council**

Legend

Priority Development Areap

TOONDAH HARBOUR PDA

Cadastre

Cadastre

MSES - Regulated vegetation (intersecting a watercourse)

MSES - Regulated vegetation (intersecting a watercurse)

MSES - Wetlands (palustrine, estuarine and lacustrine)

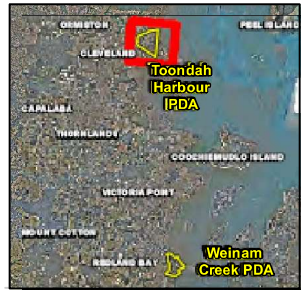
MSES - Wetlands (palustrine, estuarine and lacustrine)

MSES - Wildlife habitat

MSES - Wildlife habitat

MSES - Protected area

MSES - Protected area



Coordinate System: GCS GDA 1994
Datum: GDA 1994
Units: Degree

1:1,578 at A3

0 0.00750.015 0.03 0.045 0.06 Kilometers

Notes: Contains data sourced from QLD Government.
Image from Nearmaps 2013

Date: 20/01/2014 Drawn By: MG Reviewed by: PL

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BAAM ECOLOGICAL CONSULTANTS



Figure: 3.5

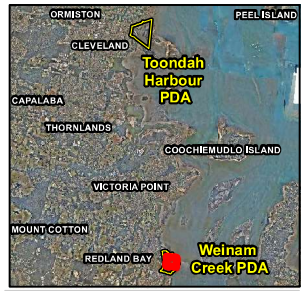
Title: State Planning Policy Matters of State Environmental Significance Weinam Creek PDA

Project: **Ecological and Coastal Processes Advice: Toondah Harbour and Weinam Creek PDAs**

Client: **Redland City Council**

Legend

Priority Development Area
WEINAM CREEK PDA
Cadastre (10k)
Cadastre (10k)
MSES - Regulated vegetation (intersecting a watercourse)
MSES - Regulated vegetation (intersecting a watercourse)
MSES - Wetlands (palustrine, estuarine and lacustrine)
MSES - Wetlands (palustrine, estuarine and lacustrine)
MSES - Wildlife habitat
MSES - Wildlife habitat
MSES - Protected area
MSES - Protected area
MSES - Regulated vegetation
MSES - Regulated vegetation



Coordinate System: GCS GDA 1994
Datum: GDA 1994
Units: Degree

1:1,578 at A3

0 0.00750.015 0.03 0.045 0.06
Kilometers

Notes: Contains data sourced from QLD Government.
Image from Nearmaps 2013

Date: 20/01/2014 Drawn By: MG Reviewed by: PL

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3.2.4 Threatened and Near Threatened Species

The desktop assessment identified 36 and 39 NC Act-listed EVNT species as having potential to occur in the Toondah Harbour and Weinam Creek PDA study areas, respectively (**Appendices 1** and **2**).

Appendices 3 and **4** lists all significant species obtained from the database searches and indicates the likelihood of their occurrence in the PDAs, given the habitats available. **Table 3.3** summarises those NC-listed EVNT species that are known or are considered likely to occur in either of the Toondah Harbour or Weinam Creek PDAs.

Based on the field survey and habitat assessment, three terrestrial fauna species are known or likely to occur in the Toondah Harbour and Weinam Creek PDAs, namely Koala, Eastern Curlew and Little Tern, while a fourth species, Illidge's Ant-blue Butterfly, has potential to occur at Weinam Creek (**Table 3.3**).

Both the Toondah Harbour and Weinam Creek PDAs are mapped under the KSPRP as Priority Koala Assessable Development areas. Under the KSPRP, development within Priority Koala Assessable Development areas must provide safe Koala movement opportunities and habitat connectivity values, in addition to a requirement to offset clearing of non-juvenile Koala habitat trees in areas mapped as bushland or high to medium value rehabilitation. Non-juvenile Koala habitat (NJKHT)trees are a food tree of the *Corymbia, Melaleuca, Lophostemon* or *Eucalyptus* genera or preferred shelter species such as *Angophora*, with a height of more than four meters or a circumference of more than 31.5 cm at 1.3 m above the ground.

Table 3.3 Species listed as threatened or near threatened species under the NC Act that are known to occur or are considered likely or to have potential to occur in either of the Toondah Harbour or Weinam Creek PDAs.

Species	Common name	EPBC	NCA	Toondah	Weinam
Caretta caretta	Loggerhead Turtle	E,M	E	Potential	Potential
Chelonia mydas	Green Turtle	V,M	V	Likely	Likely
Eretmochelys imbricata	Hawksbill Turtle	V,M	V	Possible	Possible
Lepidochelys olivacea	Pacific Ridley	E,M	E	Unlikely	Unlikely
Natator depressus	Flatback Turtle	V,M	V	Unlikely	Unlikely
Dermochelys coriacea	Leathery Turtle	E,M	E	Unlikely	Unlikely
Numenius madagascariensis	Eastern Curlew	M	NT	Known	Likely
Sternula albifrons	Little Tern	M	E	Likely	Likely
Phascolarctos cinereus	Koala (SEQ Bioregion)	V	V	Known	Known
Dugong dugon	Dugong	M	V	Likely	Potential
Sousa chinensis	Indo-Pacific Hump-backed Dolphin	M	NT	Unlikely	Unlikely
Megaptera novaeangliae	Humpback Whale	V,M	V	Unlikely	Unlikely
Acrodipsas illidgei	Illidge's Ant-blue Butterfly		V	Unlikely	Potential

Toondah Harbour PDA

Koala: The occurrence of Koala in the PDA is discussed earlier under **Section 3.1.4**. Areas within the Toondah Harbour PDA are mapped as 'medium value rehabilitation' under the KSPRP (**Figure 3.6**). Under the KSPRP, clearing of non-juvenile Koala habitat trees within 'medium value rehabilitation' requires offsetting at the rate of five new Koala habitat trees per tree lost, or an equivalent cash contribution. Non-juvenile Koala habitat trees within the PDA comprise 51 primary food trees (*Eucalyptus tereticornis*, E*. robusta* or *E. microcorys*) and 34 other habitat trees (**Figure 3.6**); of all Koala habitat trees, 58 occur within areas mapped as 'medium value rehabilitation' under the KSPRP.

Eastern Curlew: Small numbers of Eastern Curlew are likely to forage on intertidal mudflat and seagrass beds within the PDA, as discussed earlier under **Section 3.1.5**. Under the Queensland Biodiversity Offset Policy (DERM 2011), impacts on foraging habitat of Eastern Curlew and other special least concern migratory species within the PDA may require offsets.

Little Tern: Little Tern is a likely regular visitor, foraging for small fish over open coastal waters within the PDA; however project actions are unlikely to impact on this species.

EVNT Flora: No EVNT flora species are known or likely to occur in the Toondah Harbour PDA (**Appendix 3**).

Marine Mammals:

Whilst two listed vulnerable or near threatened cetacean species have been recorded in Moreton Bay; (humpback whale and the Indo-Pacific hump-backed dolphin). It is possible the Indo-Pacific hump-backed dolphin would occasionally occur in the vicinity of the Toondah Harbour PDA as these species occur in waters near the coast.

Dugong are also listed as vulnerable. As discussed above, they are most often seen foraging on seagrass, with only approximately 10% of the dugong sightings in Moreton Bay were in zone 6 (which includes the waters near the Toondah Harbour PDA). Most dugongs (80 – 98% of the total population) were found in zone 4 in association with the extensive seagrass beds of the 'eastern banks' of Moreton Bay (Lanyon 2003).

Shallow seagrass beds containing seagrass species consumed by dugong were recorded in the Toondah Harbour PDA, particularly in the northeast section of the PDA. Dugong are likely to occur in the area, but are unlikely to be common due to the relatively poor quality of seagrass habitat compared with other areas in eastern Moreton Bay.

Marine Reptiles:

As previously discussed, only three species of marine turtle (loggerhead turtle, green turtle and hawksbill turtle) are likely to occur in the subtidal and intertidal areas adjacent to the Toondah Harbour PDA. Only sub-adult and adult green turtles are likely to commonly occur in and adjacent to the PDA. Green turtles frequently inhabit shallow areas with seagrass beds, such as those found in the northern section of the PDA.

Weinam Creek PDA

Koala: The occurrence of Koala in the PDA is discussed earlier under **Section 3.1.4**. Areas within the Weinam Creek PDA are mapped as 'low value rehabilitation' and 'high value other' under the KSPRP (**Figure 3.7**); there are no offsetting requirements for these two habitat value categories.

Under the KSPRP development within Priority Koala Assessable Development areas must provide safe Koala movement opportunities and habitat connectivity values, in addition to any offset requirements.

Eastern Curlew: As discussed under **Section 3.1.5**, intertidal habitats within the PDA are of marginal value to migratory shorebirds, including Eastern Curlew. Therefore the species is likely to be a rare visitor to intertidal habitats within the PDA, and project activities are unlikely to have a significant impact on the species or its habitat.

Little Tern: Little Tern is a likely regular visitor, foraging for small fish over open coastal waters within the PDA; however project actions are unlikely to impact on this species or its habitat.

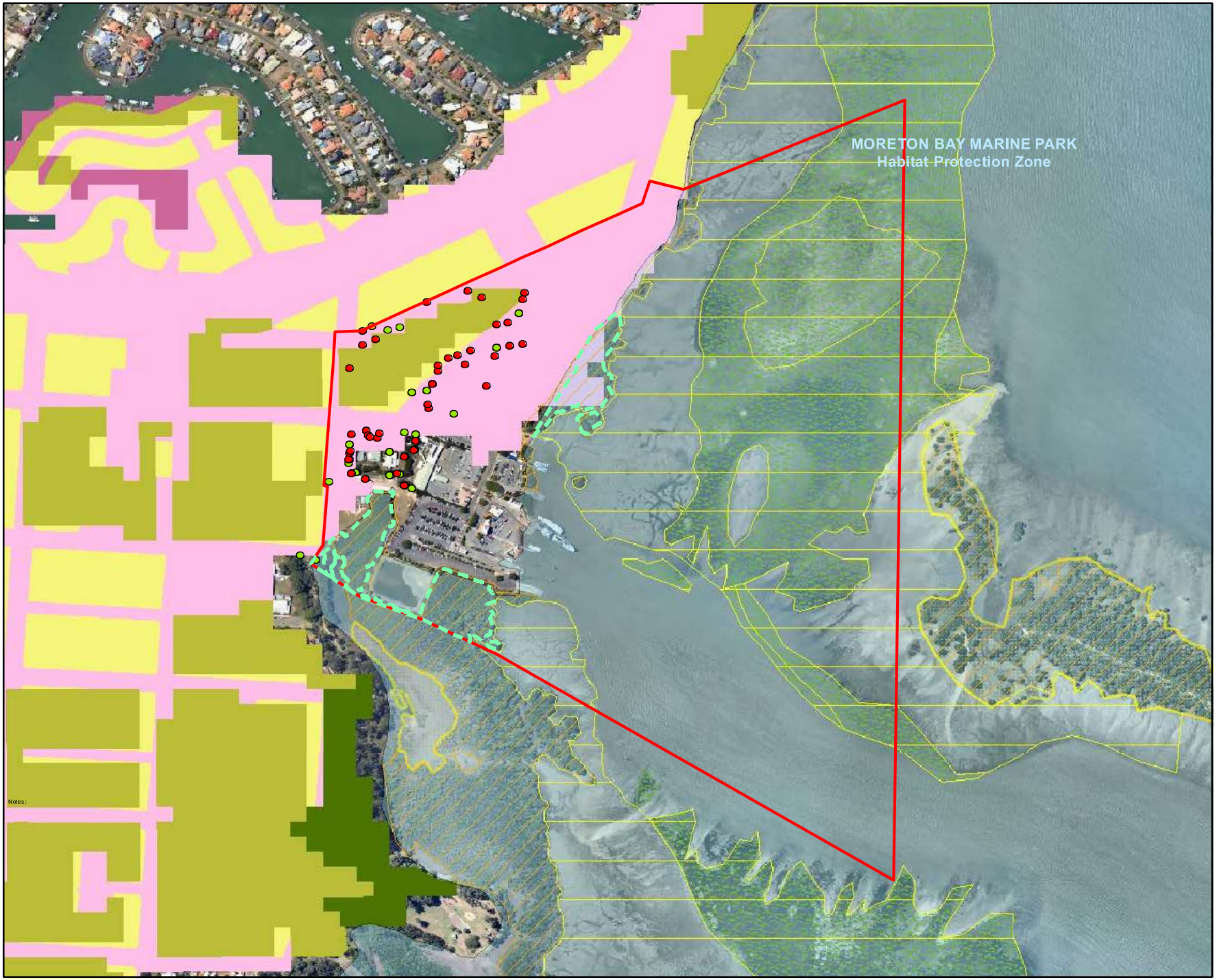


Figure: 3.6

Title: Ecological values under State Government Legislation within Toondah Harbour PDA

Project: Ecological and Coastal Processes Advice: Toondah Harbour and Weinam Creek PDAs

Client: Redland City Council

LEGEND

Koala Food Trees:
- Primary
- Secondary
- Other

Habitat
- Seagrass
- Mangroves
- Migratory Shorebird Foraging Habitat
- Migratory Shorebird Roost Sites
- Habitat Protection Zone

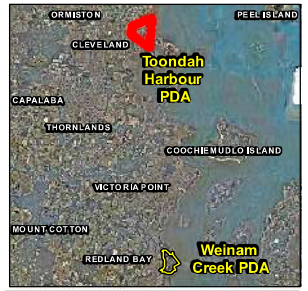
KOALA PLANNING AREAS v1p2

Bushland Habitat
- High Value Bushland

Suitable for Rehabilitation
- High Value Rehabilitation
- Medium Value Rehabilitation

Other Areas of Value
- High Value Other
- Medium Value Other

Regulated Vegetation
- Of Least Concern RE
- PDA Boundary



Coordinate System: GCS GDA 1994
Datum: GDA 1994
Units: Degree

1:6,210 at A3

0 0.0275 0.055 0.11 0.165 0.22 Kilometers

Notes: Contains data sourced from QLD Government, Image from Nearmaps 2013

Date: 16/01/2014 Drawn By: MG Reviewed by: PL

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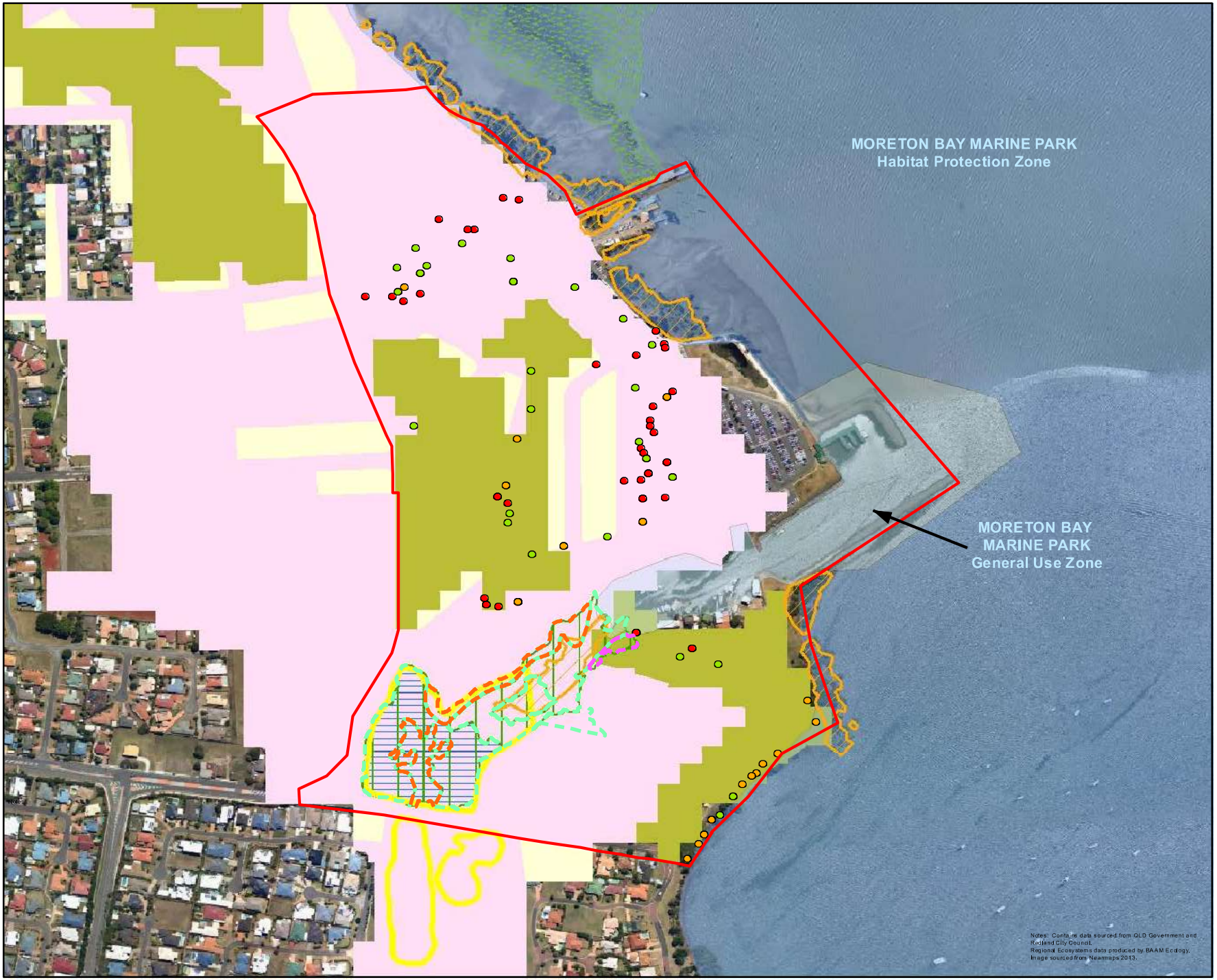


Figure: 3.7

Title: Ecological values under State Government Legislation within Toondah Harbour PDA

Project: Ecological and Coastal Processes Advice: Toondah Harbour and Weinam Creek PDAs

Client: Redland City Council

LEGEND

Koala Food Trees:
- Primary
- Secondary
- Other

Habitat
- Flying Fox Camp
- Potential Illidges' Ant Blue Butterfly
- Seagrass
- Mangroves
- Wallum froglet - Essential habitat

Moreton Bay Marine Park
- General Use
- Habitat Protection

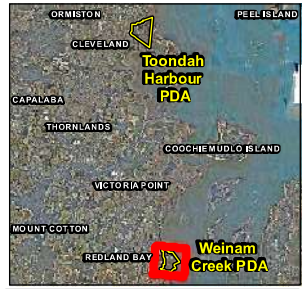
Regional Ecosystem - VM Class
- Endangered Dominant
- Of Concern Dominant
- Least Concern Dominant

Koala Planning Areas

Bushland Habitat
- Low Value Bushland

Suitable for Rehabilitation
- Medium Value Rehabilitation
- Low Value Rehabilitation

Other Areas of Value
- High Value Other
- Low Value Other
- PDA Boundary



Coordinate System: GCS GDA 1994
Datum: GDA 1994
Units: Degree

1:4,740 at A3

0 0.020.04 0.08 0.12 0.16 Kilometers

Date: 16/01/2014 Drawn By: MG Reviewed by: PL

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Illidge's Ant-blue Butterfly: Potential habitat for Illidge's Ant-blue Butterfly is present in the form of remnant mangrove and fringing *Casuarina glauca* trees along Weinam Creek (**Figure 3.7**). The larvae of this species inhabit the nests of *Crematogaster* ants in hollow branch stubs of trees within and adjoining mangrove habitats, particularly old-growth *Avicennia marina* and *Casuarina glauca* trees.

Flying-fox camp: A flying-fox roosting camp currently exists in the Weinam Creek swamp (**Figure 3.5**), primarily on the northern side of Moore's Road, but occasionally spilling over to the southern side of Moore's Road when very large numbers of flying-foxes are present. This is one of the key flying-fox roost sites in Redland City and is used by up to ten thousand flying-foxes of three species: Black Flying-fox, Grey-headed Flying-fox and Little Red Flying-fox. Total numbers of flying-foxes occupying the camp vary seasonally (**Figure 3.8**). The camp is used by both Black and Grey-headed flying-foxes for mating, birthing and as a maternity camp. With the exception of irregular occasions when very large numbers of Little Red Flying-fox inhabit the camp for up to two months at a time, the flying-foxes concentrate within the interior of the Weinam Creek swamp where they pose limited nuisance to local residents.

Historically, this flying-fox camp was used by a small number (200-300) of Black Flying-fox which appeared to shift between this site and a site adjoining Pitt Street; however, following the arrival of thousands of Little Red Flying-fox at the Pitt Street camp in 2006 and soon after development behind this site, there seemed to be a more permanent shift to the Weinam Creek swamp (Jennifer Davis, Senior Extension Officer – Wildlife, Redland City Council, personal communication), a location where the camp generally poses less nuisance to local residents than the Pitt Street camp due to the greater distance of the camp core from residential dwellings.

Under a proposed new State Government approach to managing flying-fox roosts, Redland City Council will have an as-of-right authority as the principal manager of flying-fox roosts within the defined urban area of Redland City to undertake roost management activities in the public interest in accordance with a Code of Practice and Statement of Management Intent (DEHP 2013).

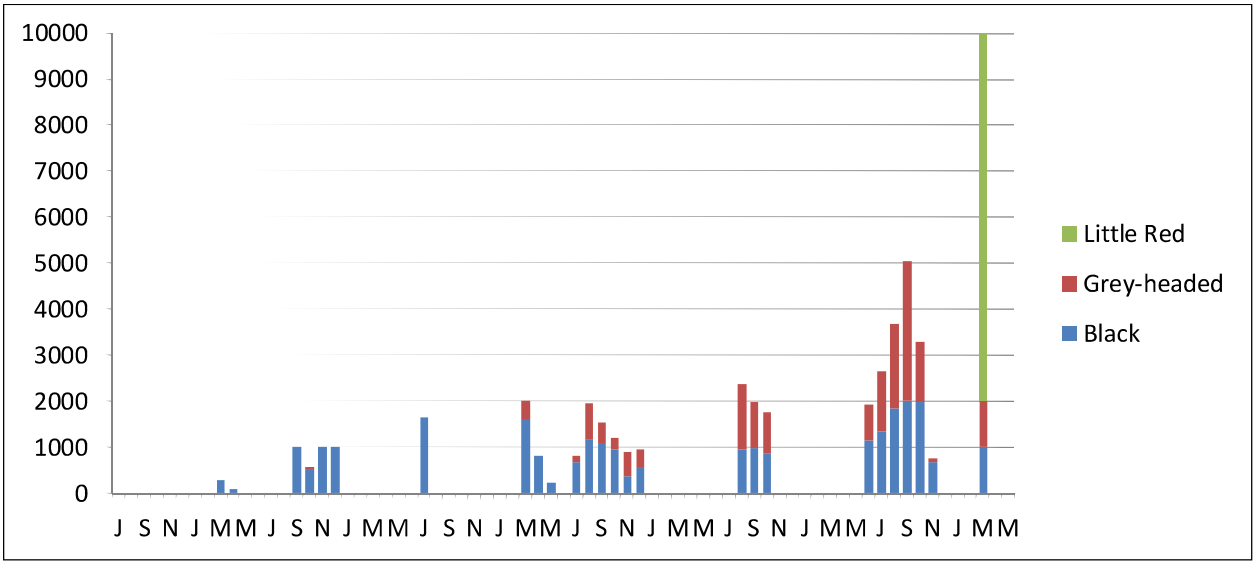


Figure 3.8. Numbers of Black, Grey-headed and Little Red flying-foxes present at the Weinam Creek flying-fox camp over the period July 2007 to May 2013 (Source of count data: Queensland Department of Environment and Heritage Protection).

Marine Mammals:

Of the State listed threatened marine mammals, humpback whales are unlikely to occur in the vicinity of the Weinam Creek PDA. It is possible that Indo-pacific humpback dolphins would occur in the area; however, individuals are not likely to occur frequently or in high abundance.

Similar to Toondah Harbour PDA, approximately 10% of the dugong sightings in Moreton Bay were in waters near the Weinam Creek PDA. As such, an even lower proportion of the dugong population would be expected to have occurred in the vicinity of the Weinam Creek PDA. Most dugong (80 – 98% of the total population) were found in zone 4 in association with the extensive seagrass beds of the 'eastern banks' of Moreton Bay (Lanyon 2003).

As discussed previously, the majority of dugong found in the southern bay are concentrated in the Southern Bay Islands between Macleay, Russell, Karragarra and Garden islands (Groom *et al*. 2004). There was one sighting offshore of the Weinam Creek Marina Entrance Channel; however, no dugong feeding trails through seagrass beds were observed in the vicinity of the Weinam Creek PDA (Groom *et al.* 2004). The seagrass beds north the Weinam Creek PDA are of relatively low to moderate value to dugong due to the presence of a high proportion of rubble in the sediment, so individuals are unlikely to occur frequently.

Marine Reptiles:

As previously discussed, only three species of marine turtle (loggerhead turtle, green turtle and hawksbill turtle) may occur in the subtidal and intertidal areas adjacent to the Weinam Creek PDA. Only sub-adult and adult green turtles are likely to commonly occur in and adjacent to the PDA. Foraging habitat for marine turtles occurs in and adjoining the Weinam Creek PDA; however, it is of relatively low value.

Proximity of a flying-fox camp to areas of human use, particularly habitation and recreational spaces, often results in conflict between people and flying-foxes due to the nuisance of noise, odour and faecal 'rain'. To avoid the potential for conflict, development should maintain a sufficient buffer between the existing flying-fox camp and proposed new areas of human use to avoid nuisance impacts of flying-foxes. Any development options that might require roost management actions targeted at destroying the roost or encouraging the flying-foxes to leave the roost site should first consider the implications of shifting the flying-foxes elsewhere within the local area where they may pose an even greater problem. Any proposed roost management actions may also require referral to the Commonwealth as Grey-headed Flying-fox regularly occupies the camp (**Section 3.1.4**).

EVNT Flora: Potential habitat for the Lesser Swamp Orchid (*Phaius australis*; NC Act: Endangered) is present in an area of *Melaleuca* forest in the south-western corner of the Weinam Creek PDA. However, this species was not observed during field survey in this habitat and is therefore considered unlikely to occur.

3.2.5 Regulated Vegetation

Figures 3.4 and 3.5 show remnant RE polygons currently mapped by DEHP within the PDAs, the indicated extent and status of which have been confirmed on the basis of ground-truthing undertaken during the current field survey. **Figures 3.9 and 3.10** (**Section 3.3**) show all RE patches ground-truthed during the current field survey, including those not currently mapped or not "mappable" by DEHP due to their limited size.

Toondah Harbour PDA

The Toondah Harbour PDA contains patches of vegetation currently mapped by DEHP as remnant RE 12.1.2 and RE 12.1.3, both of which have a 'Least Concern' status under the VM Act (**Figure 3.6**). One of these polygons was also found to contain a small area of RE12.3.5 (also 'Least Concern') during recent ground-truthing (**Figure 3.9**).

No Endangered or Of Concern REs are currently mapped in the Toondah Harbour PDA, but remnant vegetation that is "intersecting a watercourse" is also regulated. Unless exempt, clearing of watercourse vegetation is restricted under the State Development Assessment Provisions (Module 8).

The Weinam Creek Priority Development Area is currently mapped by DEHP as containing remnant vegetation of RE 12.1.3 (Least Concern) /12.1.1 (Of Concern) and RE 12.3.5

(Least Concern). The polygon of RE 12.3.5 is also currently mapped by DEHP as Essential Habitat for *Crinia tinnula* (Wallum Froglet). The area mapped as RE12.3.5 was ground-truthed to contain patches of RE12.3.5a and RE12.1.1 (Of Concern), while the area mapped as RE 12.1.3 /12.1.1 was ground-truthed to contain patches of RE12.1.3, RE12.1.1, 12.1.2 (Least Concern) and 12.5.2 (Endangered) (**Figure 3.7, Figure 3.10**). A number of other, small patches of remnant vegetation were also ground-truthed that are not currently mapped by DEHP, as discussed in **Section 3.3**.

The clearing of State mapped, regulated vegetation is assessed under the *Vegetation Management Act 1999*. Unless the purpose of the clearing can be defined as an 'exemption' under this Act, a permit, and potentially the provision of offsets, will be required prior to its removal.

An area of regulated vegetation is currently mapped in Weinam creek, which is consistent with current EHP mapping of a Least Concern/Of Concern RE (co-dominant) remnant vegetation (Figure. Regulated vegetation that is intersecting a watercourse is also present .

In addition to the intent of the SPP in avoiding impacts on MSES such as Endangered and Of Concern RES, clearing of Of Concern vegetation mapped by EHP is restricted under the State Development Assessment Provisions (Module 8) unless the proposed activity is exempt or the RE is shown not to exist through field assessment. Figure **3.10** shows patches of Least Concern, Of Concern and Endangered REs in this area that were ground-truthed during our assessment but are yet to be mapped by EHP. Other mapped regulated vegetation is that which is "intersecting a watercourse",

3.2.6 High Conservation Value Wetlands

The Toondah Harbour and Weinam Creek PDAs are in the coastal zone and fall within a coastal management district, under the CP Act. Areas of high ecological significance are mapped in both the Toondah Harbour and Weinam Creek PDAs.

Toondah Harbour PDA

There are two areas of high ecological significance within the Toondah Harbour PDA; one small area to the north of the PDA, and a much larger area to the south of the PDA.

The small area of high ecological significance habitat in the north of the PDA has mangroves that are of moderate value to fisheries. This patch of mangroves is bordered by low to moderate value migratory shorebird foraging habitat.

The area of high ecological significance to the south of the PDA consists of a dense mangrove forest. This mangrove forest is adjacent to an area of saltmarsh, and is connected to intertidal seagrass habitats, providing high value fisheries habitat. However, only a small portion of this area of high ecological significance is within the boundary of the PDA; the vast majority extends to the south of the PDA, and is unlikely to be influenced by development within the PDA where appropriate management of potential impacts and mitigation measures are used.

Weinam Creek PDA

The lower estuarine reach of Weinam Creek in the southwest section of the Weinam Creek PDA is designated an area of high ecological significance. This area consists of dense mangrove forest and saltmarsh, and provides high value habitat for fisheries.

3.2.7 Legally Secured Offset Areas

The recently revised Regulated Vegetation Management Maps published by the Department of Natural Resources and Mines (DNRM) indicate legally secured offset areas through the 'Category A' designation. No Category A is shown in either of the PDA areas. Therefore, no legally secured offset areas occur in either of the PDAs.

3.3 MATTERS OF LOCAL ENVIRONMENTAL SIGNIFICANCE

3.3.1 Locally Significant Vegetation

Recent vegetation management legislation reforms have deregulated regrowth vegetation (this being non-remnant, native vegetation that has not been cleared since 31 December 1989) on freehold and Indigenous land. Therefore, as of December 2013, regrowth vegetation is no longer a matter of state environmental significance. However, whilst no longer relevant from a state legislative perspective, regrowth vegetation throughout each PDA has local significance and was mapped for the purposes of this report.

Similarly, a number of remnant RE patches have been ground-truthed during the current field survey that are not currently mapped or not "mappable" by DEHP due to their limited size. Whilst not currently protected under State legislation, these patches have local significance and have been mapped for the purposes of this report.

Figure 3.9 identifies all areas of remnant and regrowth vegetation ground-truthed within the Toondah PDA. This includes remnant vegetation patches equating to RE12.1.2, 12.1.3 and 12.3.5 (all Least Concern under the VM Act), and regrowth vegetation patches equating to RE12.1.1, 12.1.2, 12.1.3 and 12.5.2.

Figure 3.10 identifies all areas of remnant and regrowth vegetation ground-truthed within the Weinam PDA. This includes remnant vegetation patches equating to RE12.1.1 (Of Concern under the VM Act), 12.1.2, 12.1.3, 12.3.5a (all Least Concern), 12.5.2 and 12.5.3 (both Endangered), and regrowth vegetation patches equating to REs 12.1.1, 12.1.3, 12.5.2.

3.3.2 Koalas, Koala habitat and non-juvenile habitat trees

The occurrence of Koalas in the PDAs is outlined earlier in **Sections 3.1.4** and **3.2.5**. The RCC *Koala Policy and Implementation Strategy 2008* (RCC Koala Strategy) identified the need to stop the rapid continuing decline of Koala in Redland City and aims to take action to recover the existing population to more than 5,000 Koalas by 2014. Of particular relevance to the PDAs are Action 1.1.2 of the Strategy *Protection and Enhancement of habitat (with an overall net gain of habitat within the urban footprint…)* and Action 1.1.7 *No new arterial roads constructed outside of existing priority infrastructure network and any unavoidable loss of habitat to be offset; replanting is required two to five years prior to habitat loss.*

A total of 286 non-juvenile Koala habitat trees were identified within the Toondah Harbour PDA (**Figure 3.9**). Of these, 115 habitat trees fall within areas mapped as Open Space under the Redlands Planning Scheme V3.1. Under the RCC Koala Strategy, clearing of Koala habitat trees within open space areas should be offset at the ratio of one Koala habitat tree for every meter in height of Koala habitat trees lost.

Approximately 196 non-juvenile Koala habitat trees were identified within the Weinam Creek PDA (**Figure 3.10**). Of these, a total of 56 Koala habitat trees occur within either open space, enhancement corridor, or bushland habitat overlays. Under the RCC Koala Strategy, clearing of these trees should be offset at the ratio of one Koala habitat tree for every meter in height of Koala habitat tree lost.

3.3.3 Locally significant native species and their habitats

The objective of the RCC Biodiversity Strategy is to protect, maintain and rehabilitate environmental values and biodiversity.

There are fauna species recognised as locally significant species in the RCC *Biodiversity Strategy 2008-2012* are known or likely to occur in the PDAs (**Table 3.6**). Flora species recognised as locally significant species in the RCC *Biodiversity Strategy 2008-2012* were located at both Toondah (6 species) and Weinam Creek (8 species) during the field survey (**Table 3.6**).



Figure: 3.9

Title: Matters of Local Environmental Significance within Toondah Habour PDA

Project: **Ecological and Coastal Processes Advice: Toondah Harbour and Weinam Creek PDAs**

Client: **Redland City Council**

LEGEND

Koala Food Trees:

- Primary
- Secondary
- Of no value

Regional Ecosystems (BAAM)

- Remnant RE
- Regrowth RE

Environmental Inventory Map v 4.3

Stage 4 CMAs

- Priority Tidal
- Major Foreshore
- General Patch

Redlands Planning Scheme V6 2013

- Open Space
- PDA Boundary



Notes: Contains data sourced from QLD Government and Redland City Council
Regional Ecosystems data produced by BAAM Ecology.
Image sourced from Nearmaps 2013.

Coordinate System: GCS GDA 1994
Datum: GDA 1994
Units: Degree

1:5,478 at A3

0 50 100 200 Meters

Date: 16/01/2014 Drawn By: MG Reviewed by: PL

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Figure: 3.10

Title: Matters of Local Environmental Significance within Weinam Creek PDA

Project: **Ecological and Coastal Processes Advice: Toondah Harbour and Weinam Creek PDAs**

Client: **Redland City Council**

LEGEND

Koala Food Trees:

- Primary
- Secondary
- Of no value

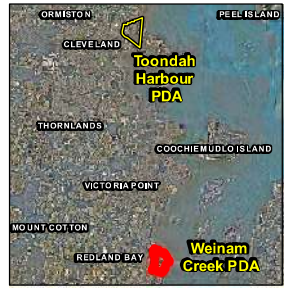
Regional Ecosystems (BAAM)

- Remnant RE
- Regrowth RE
- PDA Boundary

Environmental Inventory Map v 4.3

Stage 4 CMAs

- Priority Tidal
- Priority Patch
- Major Foreshore
- Major Patch
- Enhancement Foreshore
- Enhancement Corridor
- General Patch



Notes: Contains data sourced from QLD Government and Redland City Council.
Regional Ecosystems data produced by BAAM Ecology.
Image sourced from Nearmaps 2013.

Coordinate System: GCS GDA 1994
Datum: GDA 1994
Units: Degree

1:4,740 at A3

0 0.020.04 0.08 0.12 0.16 Kilometers

Date: 16/01/2014 Drawn By: MG Reviewed by: PL

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Table 3.4. RCC locally significant flora and fauna species known or likely to occur in the Toondah Harbour and Weinam Creek PDA areas.

Species	Toondah	Weinam Ck
Fauna		
Frogs		
Tusked Frog *Adelotus brevis*	Unlikely	Potential
Clicking Froglet *Crinia signifera*	Potential	Likely
Common Green Tree Frog *Litoria caerulea*	Known	Likely
Bleating Tree Frog *Litoria dentata*	Unlikely	Potential
Peron's Tree Frog *Litoria peronii*	Unlikely	Likely
Great Broodfrog *Pseudophryne major*	Unlikely	Potential
Copper-backed Broodfrog *Pseudophryne raveni*	Unlikely	Potential
Reptiles		
Friendly Sunskink *Lampropholis amicula*	Unlikely	Potential
Lace Monitor *Varanus varius*	Potential	Potential
Birds		
Magpie Goose *Anseranas semipalmata*	Unlikely	Potential
Little Wattlebird *Anthochaera chrysoptera*	Unlikely	Potential
Bush Stone Curlew *Burhinus grallarius*	Known	Known
White-bellied Sea Eagle *Haliaeetus leucogaster*	Likely	Likely
Wandering Tattle *Heteroscelus incanus*	Potential (marine)	Potential (marine)
Variegated Fairy-wren *Malurus lamberti*	Potential	Potential
Red-backed Fairy-wren Malurus melanocephalus	Likely	Likely
Red-browed Finch *Neochmia temporalis*	Potential	yes
Little Curlew *Numenius minutus*	Potential (marine)	Potential (marine)
Osprey *Pandion haliaetus*	yes	yes
Double-barred Finch *Taeniopygia bichenovii*	Potential	Likely
Mammals		
Large-footed Myotis *Myotis macropus*	Potential	Potential
Squirrel Gliders *Petaurus norfolcensis*	Potential	Potential
Black Flying-fox *Pteropus alecto*	Known	Known
Little Red Flying- fox Pteropus scapulatus	Known	Known
Greater Broad-nosed Bat *Scoteanax rueppellii*	Potential	Potential
Eastern Broad-nosed Bat *Scotorepens orion*	Potential	Potential
Echidna *Tachyglossus aculeatus*	Potential	Potential
Eastern Forest Bat *Vespadelus pumilus*	Potential	Potential
Eastern Cave Bat *Vespadelus troughtoni*	Potential	Potential
Freshwater Fish		
Megalops cyprinoides	Potential (marine)	Potential (marine)
Flora		
Acronychia imperforata	Unlikely	Known
Aegiceras corniculata	Known	Known
Avicennia marina	Known	Known
Bruguiera gymnorhiza	Unlikely	Known
Casuarina glauca	Known	Known
Melaleuca quinquenervia	Known	Known
Rhizophora stylosa	Known	Known
Sporobolus virginicus	Known	Known

3.3.4 *Foreshores, Wetlands and Waterways*

Toondah Harbour PDA

No foreshore, wetlands or waterways listed in the Redland Planning Scheme occur near the Toondah Harbour PDA. However, natural wetlands were recorded in the area, including mangrove forest and seagrass beds. The mangrove forest on the southern end of the PDA was assessed as having high value. This forest contains a high diversity of mangrove species, and is adjacent to seagrass and saltmarsh, providing high quality fisheries habitat. The seagrass meadows to the northeast of the PDA are also of moderate value, and may provide food for dugong and marine turtles, as well as a foraging ground for shorebirds. Dugong, turtles and shorebirds are iconic native fauna recognised in the Redland Planning Scheme.

Weinam Creek PDA

The Redlands Planning Scheme identifies two major waterways (including Weinam Creek and a smaller, unnamed tributary), and waterway and wetland buffers, within the Weinam Creek PDA. In addition, the Weinam Creek PDA contains additional wetland habitat comprised of moderate to high value mangrove forests and is bordered by low to moderate quality intertidal and subtidal seagrass beds. Weinam Creek contains particularly high value mangrove forests and saltmarsh. Although the seagrass beds to the north of the PDA are of low to moderate value, they may still provide foraging habitat for marine turtles, shorebirds and occasionally dugong. Dugong, turtles and shorebirds are iconic native fauna recognised in the Redland Planning Scheme. Higher value seagrass beds are found outside the PDA.

3.3.5 Council Reserves

One reserve/park is located within the Toondah Harbour PDA, namely GJ Walter Park, located on the foreshore north of Middle Street and the ferry terminal.

The Weinam Creek PDA includes several parks/reserves:

- Sel Outridge Park, Hamilton Street Park and New Stafford Park in the north; and
- Weinam Creek Corridor-Meissner Street, Toms Park and Rusters Reserve in the southern portion of the PDA.

3.3.6 Conservation Management Priorities

RCC conservation management priorities are mapped under the Environmental Inventory Map Version 4.3. The map identifies habitat values within the city using categories called Conservation Management Areas (CMA). The CMA code indicates the area's status (Priority, Major, General, Enhancement), as well as the area's structure and function in the landscape (Habitat, Patch, Corridor, Foreshore, Link, Mosaic).

The Environmental Inventory mapping is used by RCC to identify areas for environmental protection through the application of the RCC 'Habitat Protection Overlay Code'. This overlay requires development to protect existing environmental values through various measures, such as requiring the development to be sited in a suitable area of the property that does not interfere with the environmental values, requiring setbacks from bushland or marine habitat, or outside enhancement corridors, or requiring improvements in environmental values through re-vegetating degraded areas with native plants and removing weed species.

Within the Toondah Harbour PDA, the northern and southern marine habitats are identified as Priority Conservation Management Areas (priority tidal), while the western and eastern vegetated habitats bordering GJ Walter Park are identified as General Conservation Management Areas (general patch) (**Figure 3.9**).

Within the Weinam Creek PDA, Priority Conservation Management Areas include intertidal marine habitats (priority tidal) and the central portions of the vegetation associated with Weinam Creek (priority patch, priority tidal, enhancement corridor) (**Figure 3.10**). The northern and southern edges of the Weinam Creek corridor are mapped as Enhancement Corridors.

Vegetation associated with the northern creek (Sel Outridge Park) is mapped as a combination of Priority (priority tidal) and Major (major patch) Conservation Areas, with the northern edge and foreshore areas of Sel Outridge Park shown as Enhanced Foreshore. The southern edge and a small patch of vegetation on the western edge of the creek corridor are identified as Enhancement Corridor. The linear strip of southern foreshore habitats is mapped as a Major Conservation Management Area (**Figure 3.10**).

4.0 PREFERRED STRUCTURE PLANS

4.1 TOONDAH HARBOUR PDA

The Toondah Harbour PDA contains marine and terrestrial ecological values of significance locally and in terms of State, Federal and International legislation. The foreshore abuts the Moreton Bay Marine Park and Ramsar Wetland, wherein a variety of aquatic and intertidal habitat values exist and warrant consideration and protection.

Key aquatic and terrestrial ecological values and issues identified within the Toondah Harbour PDA include:

- subtropical coastal saltmarsh, which although already protected in Queensland under the *Fisheries Act 1994*, will soon be officially listed as a vulnerable ecological community under EPBC Act;
- intertidal and shallow subtidal habitat, including extensive flats supporting seagrass, mangroves and saltmarsh, that are of importance to fish and fisheries;
- seagrass and intertidal foraging habitat important to migratory shorebirds within the Ramsar site of Moreton Bay;
- presence of listed threatened and / or migratory species (such as marine turtles and dugong) which may be impacted by increased boat traffic and boat strike;
- habitat, including seagrass meadows, of importance to Dugong, dolphin and marine turtles;
- Koalas and Koala habitat trees;
- remnant vegetation;
- potential acid sulfate soils; and
- erosion-prone shorelines.

The sections below broadly describe how each proposed option outlined within the Draft Structure Plan Report (Deicke Richards, 2013a) benefits the PDA with regard to the retention of these values and where impacts on these values will trigger relevant legislation.

4.1.1 Ecological Benefits

Option 1 – Urban Harbour with Marina and Northern Channel

Development in accordance with Option 1 presents opportunities for ecological benefits, including:

- retaining the stand of mangroves at the southern end of the PDA, with some areas of natural or assisted revegetation where possible;
- The small area of subtropical coastal saltmarsh in the south-western corner of the PDA will be retained.
- Primary and secondary Koala food trees will be retained through the PDA wherever possible, to be supplemented by offset plantings both within and/or at strategic locations outside of the PDA.

  Retention of these trees in the PDA will specifically occur within a corridor linking the parklands at the northern end of the PDA with a broader habitat corridor south of the PDA. Safe movement opportunities between habitat tree patches and road signage are recommended to increase the functionality of this retained link.

- the concentration of marine activity;
- the diversion of boat traffic away from migratory shorebird roost sites south and east of the PDA through the creation of a new northern channel; and
- the opportunity to offset environmental impacts through encouragement of natural colonisation of mangroves adjacent to sea walls (providing additional benefits through defence against storm surge and rising sea level).

Development in accordance with Option 1 provides opportunities to enhance the community's engagement with coastal habitats in Moreton Bay, through:

- improving access to the coastline through construction of boardwalks;
- linking the parkland on the site through vegetated corridors planted with native flora;

- planting the perimeters of the northern parklands with Koala habitat trees and native flora to sustain existing Koala populations; and
- upgrading marina facilities to improve access to Moreton Bay.

Option 2 – Urban Harbour with Marina

Option 2 provides the same ecological benefits to the PDA as Option 1, with the added feature of an artificial beach at the northern end of the PDA for recreation, thereby further enhancing the community's engagement with coastal habitats.

Development in accordance with Option 2 presents opportunities for ecological benefits, including:

- a reduced scale of dredging, and therefore a decrease in potential impacts of dredging compared with Option 1;
- use of existing boat traffic corridors, which reduces the initial disturbance to the area and likelihood of increased boat strike of marine turtles and dugong; and
- the opportunity to offset environmental impacts through encouragement of natural colonisation of mangroves adjacent to sea walls (providing additional benefits through defence against storm surge and rising sea level).

Development in accordance with Option 2 provides opportunities to enhance the community's engagement with coastal habitats in Moreton Bay, through:

- construction of an artificial beach at the northern end of the PDA for recreation;
- improving access to the coastline through construction of boardwalks;
- linking the parkland on the site through vegetated corridors planted with native flora;
- planting the perimeters of the northern parklands with Koala habitat trees and native flora to sustain existing Koala populations; and
- upgrading marina facilities to improve access to Moreton Bay.

4.1.2 Legislative Considerations

The sections below broadly outlines legislation that will be triggered as a result of impacts to identified ecological values in the PDA, as they apply to each Structure Plan option.

Option 1 – Urban Harbour with Marina and Northern Channel

Koalas: Option 1 will result in the loss of a proportion of Koala habitat trees identified throughout the PDA, triggering the KSPRP, SPP, and the RCC Koala Strategy.

The impact of any Koala habitat trees cleared may be offset through planting Koala habitat trees at strategic sites. Locating plantings at strategic sites assists in consolidating important habitat areas outside the PDA that have been selected by Council for rehabilitation to improve habitat quality for the local Koala population. Offset planting ratios would be determined by the height, number and location of the trees proposed to be cleared with respect to State and local government regulatory mapping. Development and contingent offsetting measures could effectively ensure no net loss of Koala habitat trees.

If Koala habitat trees are retained within green space areas, safe movement opportunities between habitat tree patches are recommended to be provided, including furnished overpasses and road signage to reduce the risk of mortality from vehicle strike. Further, road design should include slow traffic points where roads bisect green space areas with Koala habitat trees.

Ramsar, fisheries and nature conservation: Option 1 would result in loss of a substantial area of intertidal seagrass and migratory shorebird foraging habitat should a marina, harbour and northern channel be constructed. The loss of marine habitat is greater in Option 1 than in Option 2. Based on the scale of potential impacts, it is likely that assessment under the EPBC Act would be required, so referral to the Commonwealth is advised. Loss of seagrass and mangrove habitat is also likely to disrupt the current mosaic of fish habitats, resulting in a loss of nursery, shelter and foraging habitat. Appropriate offsets for the loss of this habitat have been considered in the proposed structure plan.

Declaration of a works area in the Moreton Bay Marine Park would be required to allow for development of the foreshore and adjacent intertidal and subtidal habitat within the PDA. Assessment of the option-specific potential detrimental and beneficial impacts to environmental, social, cultural and economic values would be required to support the approvals process.

Offsets for the loss of marine habitat may be sought for both options. The development and implementation of a marine habitat offset plan, would contribute to mitigating the loss of:

- marine plants in the north-eastern section of the PDA associated with marina development; and
- foraging habitat for migratory shorebirds, particularly toward the western boundary of the PDA.

Option 1 may also impact listed threatened and / or migratory species, such as marine turtles and dugong, through increased boat strike. The inclusion of "go slow" areas for recreational vessels in the channels immediately north and south of the harbour would contribute to the mitigation of this potential impact.

Capital dredging to create the shared northern channel and marina would generate a large quantity of dredge spoil. Development of a dredge and spoil disposal management plan would be required to support the impact management / mitigation strategy for dredging. There is likely to be a reduction in the frequency of maintenance dredging due to the expected change in the harbour configuration. Option-specific investigation would be required to support the assessment of dredge and spoil disposal-related impacts (for both capital and maintenance dredging) and the development of dredge and spoil disposal management plans.

There would be a substantial increase in the armouring of the shoreline around the existing harbour. However, an opportunity has been identified in the Proposed Development Scheme to increase the current extent of mangroves through natural colonisation, which could enhance protection of the shoreline and mitigate against natural shoreward migration of habitats as sea levels rise.

Remnant vegetation: Option 1 will result in the clearing of 'Least Concern' remnant mangrove vegetation on the coastline. Unless exempt, the clearing of this vegetation will need to address the relevant SDAP codes.

State protected animals and plants: Option 1 will result in the clearing of some native flora and habitat for native fauna species.

Unless exempt, the following is required in accordance with the NC Act:

- A licence, permit or authority to 'take' protected plants (currently including least concern native plants).
- An approved Species Management Program for tampering with an animal breeding place that is being used by a protected animal (including least concern native species) to incubate or rear the animal's offspring.

Option 2 – Urban Harbour with Marina

Option 2 will result in the loss of a proportion of Koala habitat trees, 'Least Concern' remnant mangrove vegetation and State protected animals and plants, as identified and discussed for Option 1.

Option 2 will also entail the loss of some seagrass and migratory shorebird foraging habitat for construction of the marina and harbour, although this will be less than under Option 1. Referral to the Commonwealth under the EPBC Act is advised.

Ramsar, fisheries and nature conservation: Option 2 would likely have a moderate detrimental impact on intertidal seagrass, which is marginal migratory shorebird foraging habitat. The development of an urban harbour with marina would result in the loss of less fisheries habitat (e.g. seagrass and mangroves) than Option 1, where the existing channel and harbour are used. Some disruption of the mosaic of fish habitats and connections to fish nursery, shelter and forage habitat would occur.

As with Option 1, offsets may be required for the loss of marine plants and foraging habitat associated with the development, and referral to the Commonwealth under the EPBC Act is advised.

Declaration of a works area in the Moreton Bay Marine Park would be required to allow for development of the foreshore and adjacent intertidal and subtidal habitat within the PDA, as discussed in **Section 1.5.2** of this report.

The risk to marine turtles and dugong of increased boat strike associated with Option 2 is expected to be lower than for Option 1, as the Proposed Development Scheme would result in widening of the existing southern channel and creation of a much narrower northern channel. The inclusion of "go slow" areas for recreational vessels in the channel may help to mitigate this potential impact.

Capital dredging of the southern and northern channels and harbour in Option 2 is expected to generate less dredge spoil than Option 1, as the existing harbour and southern channel would be expanded rather than partially filled. A dredge and spoil disposal management plan would be required to support the mitigation strategy for dredging. There is likely to be a reduction in the frequency of maintenance dredging due to the expected change in harbour configuration. Option-specific investigation would be required support the assessment of dredge and spoil disposal-related impacts (for both capital and maintenance dredging) and the development of dredge and spoil disposal management plans.

As with Option 1, there would be a substantial increase in the armouring of the shoreline around the existing harbour. However, an opportunity has been identified in the Proposed Development Scheme to increase the current extent of mangroves, which could enhance protection of the shoreline and allow for natural shoreward migration of habitats as sea levels rise.

4.2 WEINAM CREEK PDA

The Weinam Creek Priority Development Area is characterised by marine, intertidal and terrestrial ecological values that are valued by the community and protected at local, State, Federal and International levels. Key ecological values and issues identified within the Weinam Creek Priority Development Area include:

- An area of potential subtropical coastal saltmarsh, which although already protected in Queensland under the *Fisheries Act 1994*, will soon be officially listed as a vulnerable ecological community under EPBC Act;
- intertidal and shallow subtidal habitat, including mangroves that are of importance to fish and fisheries;
- Koalas and Koala habitat trees;
- an important roost and maternity camp for three species of flying-fox;
- potential habitat for the NC Act listed Illidge's Ant-Blue Butterfly;
- the presence of listed threatened and / or migratory species (such as marine turtles and dugong) which may be impacted by boat strike from increased boat traffic;
- small patches of RE 12.5.2 (VM Act status Endangered);
- Weinam Creek (high cultural heritage and environmental value);
- potential acid sulfate soils; and
- erosion-prone shorelines.

The sections below broadly describe how each proposed option outlined within the Draft Structure Plan Report (Deicke Richards, 2013b) benefits the PDA with regard to the retention of these values and where impacts on these values will trigger the relevant legislation.

4.2.1 Ecological Benefits

Option 1 – New Redland and SMBI Centre

Development in accordance with 'Option 1' would present opportunities for ecological benefits, including the:

- retention of significant subtropical saltmarsh and mangrove habitat in Weinam Creek;
- potential improvements to the quality of stormwater runoff through rehabilitation of existing marine plant habitat;
- Vegetation that supports an important flying-fox roost in the Weinam Creek swamp in the south-east corner of the PDA will be retained.
- Habitat that may support Illidge's Ant-Blue Butterfly *Acrodipsas illidgei* in Weinam Creek in the south-east corner of the PDA will be conserved.

- An area of potential subtropical coastal saltmarsh associated with Weinam Creek swamp in the south-east corner of the PDA will be retained.
- Primary and secondary Koala food trees will be retained through the PDA wherever possible, to be supplemented by offset plantings both within and/or at strategic locations outside of the PDA.
- Most remnant vegetation currently occurring within the PDA will be retained, including an area mapped as 'essential habitat' for Wallum Froglet *Crinia tinnula* under the VM Act.

The proposed development also includes opportunities to enhance the community's engagement with Moreton Bay and the natural environment, including:

- improving access to the coastline through the construction of boardwalks; and
- planting the perimeters of the parklands with Koala habitat trees and native flora to sustain existing Koala populations.

Option 2 – Weinam Creek Village

Option 2 provides similar benefits to Option 1 in terms of terrestrial ecology, particularly in terms of the retention of the Weinam Creek swamp and associated values in the south-east corner of the PDA. Development in accordance with 'Option 2' would present opportunities for ecological benefit, including the:

- retention of significant subtropical saltmarsh and mangrove habitat in Weinam Creek;
- potential improvements to the quality of stormwater runoff through rehabilitation of existing marine plant habitat.

Option 3 – Weinam Creek Marina

Option 3 involves the conversion of the Weinam Creek swamp into a higher density residential development surrounding a new marina between the mouth of the creek and Moores Rd. As such, benefits in terms of terrestrial ecology are restricted to the retention of primary and secondary Koala food trees wherever possible, to be supplemented by offset plantings both within and/or at strategic locations outside of the PDA.

4.2.2 Legislative Considerations

Option 1 – New Redland and SMBI Centre

Koalas: Option 1 will result in the loss of a proportion of Koala habitat trees identified throughout the PDA, triggering the KSPRP, SPP, and the RCC Koala Strategy.

The impact of any Koala habitat trees cleared may be offset through planting Koala habitat trees in suitable areas distant from the PDA. Locating plantings at strategic sites assists in consolidating important habitat areas outside the PDA that have been selected by Council for rehabilitation to improve habitat quality for the local Koala population. Offset planting ratios would be determined by the height, number and location of the trees proposed to be cleared with respect to State and local government regulatory mapping. Development and contingent offsetting measures could effectively ensure no net loss of Koala habitat trees.

If Koala habitat trees are retained or established within green space areas, safe movement opportunities between habitat trees are recommended to be provided, including furnished overpasses, and road signage to reduce the risk of mortality from vehicle strike. Further, road design should include slow traffic points where roads bisect green space areas with Koala habitat trees.

Flying foxes: Whilst Option 1 will not result in directs impacts to the flying fox roost in Weinam Creek, it is noted that new, high-density residential development is proposed that extends to within 50m of the flying-fox camp's outer perimeter, which may create some conflict with residents.

It is recommended that future development approvals ensure buildings are designed to minimise potential conflicts (e.g. Covered walkways and parking, sound proofing, etc.)

Remnant vegetation: Option 1 will result in the clearing of a small area of remnant vegetation, which may include communities listed as Endangered and/or Of Concern under the VM Act. Unless exempt, the clearing of this vegetation will require State assessment under the *Vegetation Management Act 1999* and may require offsetting.

State protected animals and plants: Option 1 will result in the clearing of some native flora and habitat for native fauna species.

Unless exempt, the following is required in accordance with the NC Act:

- A licence, permit or authority to 'take' protected plants (currently including least concern native plants).
- An approved Species Management Program for tampering with an animal breeding place that is being used by a protected animal (including least concern native species) to incubate or rear the animal's offspring.

State protected animal breeding places:

The *Nature Conservation (Wildlife Management) Regulation 2006* requires that a relevant species management program is prepared to mitigate impacts of clearing where animal breeding places, such as hollows, nests, ponds and even leaf litter are destroyed. Disruptions to the habitat of migratory birds, Special Least Concern species, or colonial breeders, such as the three species of Flying-fox present at Weinam Creek, are required to be addressed under a specific species management program, while potential impacts on the majority of Least Concern species may be addressed in a generalised management program prepared by DEHP. The adoption of DEHP's generic species management program should be undertaken in consultation with DEHP. It should be noted that the *Nature Conservation Act 1992* remains under review at the time of writing and that some changes may affect obligations relevant to the PDAs.

Ramsar, fisheries and nature conservation: The coastal habitat along the foreshore of the PDA has limited value as foraging and roost habitat relative to other habitat to the north and south of the PDA. Option 1 is therefore expected to have a low to moderate impact on seagrass and migratory shorebird habitat within Ramsar wetlands. The impacts to fish habitat would also be low due to retention of significant mangroves and saltmarsh areas and connection with Weinam Creek. The Proposed Development Scheme would limit the loss of marine plants (such as mangroves) to those along the foreshore.

Declaration of a works area in the Moreton Bay Marine Park would be required to allow for development of the foreshore and adjacent intertidal and subtidal habitat within the PDA, as discussed in **Section 1.5.2**. Capital dredging would be required to construct the marina as part of the Proposed Development Scheme. Maintenance dredging is likely to be minor compared to Options 3. Relocating the dredge spoil retention basin along the eastern edge of the existing mangrove area, provides an opportunity to increase the buffer between tidal land and urban development.

The development and implementation of a marine habitat offset plan, could help mitigate the loss of marine plants, particularly in the northeast section of the PDA

Additional construction and recreational vessel traffic may increase the risk of boat strike to listed threatened and/or migratory species, such as marine turtles in the PDA. Inclusion of "go slow" areas for recreational and commercial vessels in the channel may help mitigate this impact.

There would be an increase in armouring of the shoreline around existing commercial traffic areas associated with this option.

Option 2 – Weinam Creek Village

Option 2 will result in the loss of a proportion of Koala habitat trees, remnant vegetation, and State protected animals and plants, and the location of high-density residential development in close proximity to the flying fox roost in Weinam Creek may create some conflict with residents, as identified and discussed for Option 1.

Ramsar, fisheries and nature conservation: The coastal habitat along the foreshore of the PDA has limited value as foraging and roost habitat relative to other habitat to the north and south of the PDA. Option 2 is expected to have a low impact on intertidal seagrass and migratory shorebird habitat, due to retention of significant mangrove and saltmarsh areas and retention of connections with Weinam Creek and other estuarine habitat types. There would be minimal impact to existing non-remnant mangroves, but they are not adjacent to extensive seagrass beds and are of lower value to fisheries than adjacent coastal and island habitat outside the PDA.

The development and implementation of a marine habitat offset plan, could help mitigate the loss of marine plants, particularly in the northeast section of the PDA

Additional construction and recreational vessel traffic may increase the risk of boat strike to listed threatened and/or migratory species, such as marine turtles in the PDA. Inclusion of "go slow" areas for recreational and commercial vessels in the channel would help mitigate this impact.

Ongoing maintenance dredging of Weinam Creek would be required; however, this would be limited compared with Option 3, due to the proximity to deep water and the existing channel. Relocating the dredge spoil retention basin along the eastern edge of the existing mangrove area, would also increase the buffer between tidal habitats and urban development.

There would be an increase in armouring of the shoreline around existing commercial traffic areas along the foreshore. However, an opportunity exists for an increase in the current extent of mangroves to the north and south, which could provide natural protection of the shoreline. Once the foreshore is armoured there would be limited opportunities for landward migration of habitats as sea levels rise; however, there are some areas to the south of the development area where this may occur.

Option 3 – Weinam Creek Marina

Option 3 will result in the loss of a proportion of Koala habitat trees, as identified and discussed for Options 1 and 2. However, the most significant implication of Option 3 from an ecological perspective will be the conversion of the Weinam Creek swamp into a higher density residential development surrounding a new marina between the mouth of the creek and Moores Rd. This will involve the removal of a known, important flying fox roost and maternity camp, the clearing of remnant vegetation (some of which has a VM Act status of Endangered and some of which is Of Concern) and associated essential habitat for Wallum Froglet and potential habitat for the Illidge's Ant Blue Butterfly, and potential occurrences of subtropical coastal saltmarsh.

Any impacts on important habitat for Grey-headed Flying-fox (an EPBC listed species) will require referral to the Commonwealth under the EPBC Act. A specialised species management program would be required to be developed in fulfilment of the *Nature Conservation (Wildlife Management) Regulation 2006* and in consultation with DEHP.

If certain areas proposed to be cleared are confirmed as subtropical coastal saltmarsh, this will also require referral as soon as this community is officially listed as a threatened ecological community.

In terms of the potential habitat for Illidge's Ant Blue Butterfly, a targeted survey for this species should be undertaken to confirm whether or not it occurs, to inform whether referral of the action to the Commonwealth is required.

Removal of State-protected vegetation and associated essential habitat will trigger assessment under the VM Act and NC Act and will likely require offsetting.

Ramsar, fisheries and nature conservation: The removal of high value mangroves and saltmarsh in Weinam Creek to create a marina in Option 3 is expected to have a greater impact on marine communities relative to Options 1 and 2. Creation of the marina could result in declines in water quality due to changes in flushing, causing indirect effects on the hydrology and affecting nearby marine plant habitats. Development of the marina would modify an existing waterway and create a barrier to fish passage during construction. This would trigger the need for a waterway barrier permit under Division 8 of the Fisheries Act.

Declaration of a works area in the Moreton Bay Marine Park would be required to allow for development of the foreshore and adjacent intertidal and subtidal habitat within the PDA as discussed in **Section 1.5.2**.

Significant offsets are likely to be required for Option 3. The development and implementation of a marine habitat offset plan, would be required to mitigate the loss of:

- marine plants, particularly those in Weinam Creek; and
- foraging habitat for migratory shorebirds.

The area to be offset along the coastline would need to be of similar quality and allow for landward migration of habitat in response to rising sea level (as Option 3 may not allow for landward migration due to hard armouring of the shoreline surrounding the marina).

Additional construction and recreational vessel traffic may increase the risk of boat strike to listed threatened and/or migratory species, such as marine turtles. The inclusion of "go slow" areas for recreational vessels in the channel would help reduce this impact.

The creation of a marina in Weinam Creek is expected to generate a much greater quantity of dredge spoil through capital dredging compared with Options 1 and 2. A dredge and spoil disposal management plan would be required to identify and guide the management of impacts associated with dredging and spoil disposal. Testing of potential dredge spoil material (in accordance with national standards) would be required due to the potential for acid sulphate soils.

There would be a substantial increase in armouring of the shoreline around existing commercial traffic areas and surrounding the new marina. There are also likely to be changes to the hydrology and floodwater flows in Weinam Creek, which could have critical impacts on the natural environment and species found there. An assessment of the effects of creating the marina on the surrounding water quality and disturbance of acid sulfate soils, would be critical to assess whether the impacts can be mitigated appropriately.

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APPENDIX 1

EPBC Act Protected Matters Search Tool Results and Wildlife Online Database Search Results for Toondah Harbour PDA

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.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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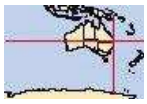
Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 1.0Km



Summary

Matters of National Environmental 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:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	46
Listed Migratory Species:	64

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 and the heritage values of a place on the Register of the National Estate.

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.

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 Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	100
Whales and Other Cetaceans:	13
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	2
State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	34
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (RAMSAR)	[Resource Information]
Name	Proximity
Moreton bay	Within Ramsar site

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Endangered	Species or species habitat likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat likely to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
Diomedea exulans antipodensis Antipodean Albatross [82269]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans exulans Tristan Albatross [82337]	Endangered	Species or species habitat may occur within area
Diomedea exulans gibsoni Gibson's Albatross [82271]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur

Name	Status	Type of Presence within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Poephila cincta cincta Black-throated Finch (southern) [64447]	Endangered	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Thalassarche melanophris impavida Campbell Albatross [82449]	Vulnerable	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Fish		
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat may occur within area
Frogs		
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus hallucatus Northern Quoll [331]	Endangered	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Potorous tridactylus tridactylus		
Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Xeromys myoides		
Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat known to occur within area
Plants		
Arthraxon hispidus		
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
Cryptocarya foetida		
Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana		
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Phaius australis		
Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area
Streblus pendulinus		
Siah's Backbone, Sia's Backbone, Isaac Wood [21618]	Endangered	Species or species habitat likely to occur within area
Taeniophyllum muelleri		
Minute Orchid, Ribbon-root Orchid [10771]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Delma torquata		
Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Lepidochelys olivacea		
Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Natator depressus		
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sharks		
Carcharias taurus (east coast population)		
Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat may occur within area
Carcharodon carcharias		
Great White Shark [64470]	Vulnerable	Species or species habitat may occur within

Name	Status	Type of Presence
		area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable*	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species habitat may occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
Migratory Marine Species		
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Carcharodon carcharias Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
Migratory Terrestrial Species		
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Xanthomyza phrygia Regent Honeyeater [430]	Endangered*	Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Roosting known to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat likely to occur within area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]		Roosting known to occur within area
Calidris ferruginea Curlew Sandpiper [856]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]		Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]		Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Roosting known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Roosting known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Roosting known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area

Name	Threatened	Type of Presence
Numenius madagascariensis Eastern Curlew [847]		Roosting known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Roosting known to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat likely to occur within area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]		Roosting known to occur within area
Calidris ferruginea Curlew Sandpiper [856]		Roosting known to occur

Name	Threatened	Type of Presence
		within area
Calidris melanotos Pectoral Sandpiper [858]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]		Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]		Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Roosting known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable*	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species habitat may occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Roosting known to occur within area
Heteroscelus incanus Wandering Tattler [59547]		Roosting known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Roosting known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Roosting known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew [847]		Roosting known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Roosting known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
Thinornis rubricollis Hooded Plover [59510]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paegnius Rough-snout Ghost Pipefish [68425]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong [28]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Reptiles		
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Laticauda laticaudata a sea krait [1093]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area

Name	Status	Type of Presence
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Southern and Eastern Moreton Bay	QLD	Registered
Historic		
Cleveland Hotel (former)	QLD	Indicative Place

State and Territory Reserves [Resource Information]

Name	State
Moreton Bay	QLD

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Bufo marinus Cane Toad [1772]		Species or species habitat likely to occur within area
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Nationally Important Wetlands [Resource Information]

Name	State
Moreton Bay	QLD

Coordinates

-27.528 153.28432

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, 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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

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:

-Department of Environment, Climate Change and Water, New South Wales
-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA 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, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Geoscience Australia
-CSIRO
-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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APPENDIX 2

EPBC Act Protected Matters Search Tool Results and Wildlife Online Database Search Results for Weinam Creek PDA

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.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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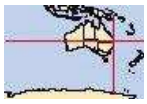
Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 1.0Km



Summary

Matters of National Environmental 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:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	47
Listed Migratory Species:	64

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 and the heritage values of a place on the Register of the National Estate.

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.

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 Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	98
Whales and Other Cetaceans:	13
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	1
State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	34
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (RAMSAR)	[Resource Information]
Name	Proximity
Moreton bay	Within Ramsar site

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat likely to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
Diomedea exulans antipodensis Antipodean Albatross [82269]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans exulans Tristan Albatross [82337]	Endangered	Species or species habitat may occur within area
Diomedea exulans gibsoni Gibson's Albatross [82271]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Thalassarche melanophris impavida Campbell Albatross [82449]	Vulnerable	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Fish		
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat may occur within area
Frogs		
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus hallucatus Northern Quoll [331]	Endangered	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Potorous tridactylus tridactylus		
Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Xeromys myoides		
Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat known to occur within area
Plants		
Arthraxon hispidus		
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
Baloghia marmorata		
Marbled Balogia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat may occur within area
Cryptocarya foetida		
Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana		
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Phaius australis		
Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area
Streblus pendulinus		
Siah's Backbone, Sia's Backbone, Isaac Wood [21618]	Endangered	Species or species habitat likely to occur within area
Taeniophyllum muelleri		
Minute Orchid, Ribbon-root Orchid [10771]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Delma torquata		
Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Lepidochelys olivacea		
Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Natator depressus		
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sharks		
Carcharias taurus (east coast population)		
Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat may occur within

Name	Status	Type of Presence
		area
Carcharodon carcharias Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable*	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species habitat may occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
Migratory Marine Species		
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Carcharodon carcharias Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or

Name	Threatened	Type of Presence
		related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
Migratory Terrestrial Species		
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur

Name	Threatened	Type of Presence
		within area
Monarcha trivirgatus		
Spectacled Monarch [610]		Species or species habitat likely to occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat likely to occur within area
Xanthomyza phrygia		
Regent Honeyeater [430]	Endangered*	Foraging, feeding or related behaviour likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat likely to occur within area
Arenaria interpres		
Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba		
Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus		
Red Knot, Knot [855]		Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]		Species or species habitat known to occur within area
Calidris ruficollis		
Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris tenuirostris		
Great Knot [862]		Species or species habitat known to occur within area
Charadrius bicinctus		
Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius leschenaultii		
Greater Sand Plover, Large Sand Plover [877]		Species or species habitat known to occur within area
Charadrius mongolus		
Lesser Sand Plover, Mongolian Plover [879]		Species or species habitat known to occur within area
Charadrius veredus		
Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew [847]		Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat likely to occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]		Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]		Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]		Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable*	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered*	Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species habitat may occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Heteroscelus incanus Wandering Tattler [59547]		Species or species habitat known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat may occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat likely to occur

Name	Threatened	Type of Presence
		within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew [847]		Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paegnius Rough-snout Ghost Pipefish [68425]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Reptiles		
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Laticauda laticaudata a sea krait [1093]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted		Species or species

Name	Status	Type of Presence
Bottlenose Dolphin [68418]		habitat likely to occur within area
Tursiops truncatus s. str.		
Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

Places on the RNE

[Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Southern and Eastern Moreton Bay	QLD	Registered

State and Territory Reserves

[Resource Information]

Name	State
Moreton Bay	QLD

Invasive Species

[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis		
Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos		
Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis		
European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata		
Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus		
House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis		
Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris		
Common Starling [389]		Species or species habitat likely to occur within area
Frogs		

Name	Status	Type of Presence
Bufo marinus Cane Toad [1772]		Species or species habitat likely to occur within area
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda		Species or species habitat likely to occur

Name	Status	Type of Presence
[18913]		within area
Eichhornia crassipes		
Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis		
Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara		
Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parthenium hysterophorus		
Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii		
Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis		
Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus		
Asian House Gecko [1708]		Species or species habitat likely to occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
Moreton Bay	QLD

Coordinates

-27.61807 153.30928

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, 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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

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:

-Department of Environment, Climate Change and Water, New South Wales
-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA 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, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Geoscience Australia
-CSIRO
-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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APPENDIX 3

Conservation significant flora and fauna species identified in the desktop assessment and their likelihood of occurrence in the Toondah Harbour PDA

Conservation significant terrestrial flora and vertebrate fauna species recorded or predicted to occur within a 1 km radius of the Toondah Harbour PDA and their likelihood of occurrence (known, likely, potential or unlikely) within or immediately adjoining the subject site.

Abbreviations: EPBC = status under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth); **NCA** = status under the *Nature Conservation Act 1992* (Queensland); **RCC** = status under the Redland City Council Biodiversity Strategy; **PM** = EPBC Protected Matters Search Tool database search within a 1 km radius of the study area; **WN** = Queensland Department of Environment and Resource Management WildNet database search within a 1 km radius of the study area; **QM** = Queensland Museum database search within a 1 km radius of the study area; **NEDS** = Association of species with a vegetation type present in PDA according to RCC's Natural Environment Decision Support; **E** = Endangered; **V** = Vulnerable; **NT** = Near Threatened; **M** = Migratory; **S** = Special Least Concern (Migratory or culturally significant); **LC** = Least Concern; **Sig** = RCC Significant; **X** = species occurrence predicted (PM or QM); **Y** =Species is associated with mapped vegetation (NEDS).

Likelihood of occurrence categories: Known – from other surveys (BAAM, other consultancies, databases), species recorded onsite; **Likely to occur** – species not known to occur onsite but the site is within the known range of the species, potentially suitable habitat is present and there are either database records for the local region or knowledge of the species occurrence suggests it may occur as a resident or visitor; means 'high potential' or good habitat is present but no species were observed onsite; **Potential to occur** – the site is within the known range of the species and potentially suitable habitat is present but there are no database records for the local region and/or it is a rare, erratic or poorly known species; means 'low potential' or habitat for species is not definitive; **Unlikely to occur –** no suitable habitat present and/or the site is outside of the known range of the species.

Family	Species	Common name	Status			Database source				Likelihood of Occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
BIRDS										
ARDEIDAE	*Ardea modesta*	Great Egret	M	S	Sig	x	6			Likely to occur on tidal mudflats and ponded areas
ACCIPITRIDAE	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	M	S	Sig	x	10			Likely to occur, foraging only
SCOLOPACIDAE	*Xenus cinereus*	Terek Sandpiper	M	S	Sig	x	9			Likely to occur on tidal mudflats
SCOLOPACIDAE	*Calidris acuminata*	Sharp-tailed Sandpiper	M	S	Sig	x	9			Likely to occur on tidal mudflats, saltmarsh and mangroves
ANSERANATIDAE	*Anseranas semipalmata*	Magpie Goose		LC	Sig		1			Unlikely to occur as preferred habitat not present
LARIDAE	*Hydroprogne caspia*	Caspian Tern	M	S	Sig		17			Likely to occur foraging over waters and on mudflats

Family	Species	Common name	Status			Database source				Likelihood of Occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
LARIDAE	*Thallaseus bergii*	Crested Tern	M	S	Sig		15			Likely to occur foraging over waters and on mudflats
MALURIDAE	*Malurus lamberti*	Variegated Fairy-wren		LC	Sig		5			Potential to occur in shrubby vegetation
MALURIDAE	*Malurus melanocephalus*	Red-backed Fairy-wren		LC	Sig		3			Potential to occur in shrubby vegetation
ESTRILDIDAE	*Neochmia temporalis*	Red-browed Finch		LC	Sig		1			Potential to occur in vegetation across PDA
CHARADRIIDAE	*Pluvialis fulva*	Pacific Golden Plover	M	S	Sig	x	8			Likely to occur on tidal mudflats, mangroves, saltmarsh, open, grassed and ponded areas
CHARADRIIDAE	*Pluvialis squatarola*	Grey Plover	M	S	Sig	x	1			Likely to occur on tidal mudflats and saltmarsh
CHARADRIIDAE	*Charadrius bicincutus*	Double-banded Plover	M	S	Sig	x	9			Likely to occur on tidal mudflats, saltmarsh and open, grassed areas
CHARADRIIDAE	*Charadrius mongolus*	Lesser Sand Plover	M	S	Sig	x	16			Likely to occur on tidal mudflats, mangroves, saltmarsh
CHARADRIIDAE	*Charadrius leschenaultii*	Greater Sand Plover	M	S	Sig	x	8			Likely to occur on tidal mudflats, mangroves, saltmarsh
SCOLOPACIDAE	*Gallinago hardwickii*	Latham's Snipe	M	S	Sig	x	1			Potential to occur in saltmarsh, mangroves and wetter, vegetated areas
SCOLOPACIDAE	*Limosa lapponica*	Bar-tailed Godwit	M	S	Sig	x	25			Likely to occur on tidal mudflats and ponded areas
SCOLOPACIDAE	*Numenius minutus*	Little Curlew	M	S	Sig	x	1			Likely to occur on tidal mudflats and open, grassy areas
SCOLOPACIDAE	*Numenius phaeopus*	Whimbrel	M	S	Sig	x	19			Likely to occur on tidal mudflats, mangroves and open, grassy areas
SCOLOPACIDAE	*Numenius*	Eastern Curlew	M	NT	Sig	x	20		Y	Likely to occur on tidal

Family	Species	Common name	Status			Database source				Likelihood of Occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
	madagascariensis									mudflats, mangroves and saltmarsh
SCOLOPACIDAE	*Tringa stagnatilis*	Marsh Sandpiper	M	S	Sig	x	1			Likely to occur on tidal mudflats and mangroves
SCOLOPACIDAE	*Actitis hypoleucos*	Common Sandpiper	M	S	Sig	x	1			Likely to occur on tidal mudflats, mangroves and saltmarsh
SCOLOPACIDAE	*Tringa brevipes*	Grey-tailed Tattler	M	S	Sig	x	21			Likely to occur on tidal mudflats and mangroves
SCOLOPACIDAE	*Arenaria interpres*	Ruddy Turnstone	M	S	Sig	x	15			Likely to occur on tidal mudflats
SCOLOPACIDAE	*Calidris tenuirostris*	Great Knot	M	S	Sig	x	10			Likely to occur on tidal mudflats
SCOLOPACIDAE	*Calidris canutus*	Red Knot	M	S	Sig	x	6			Likely to occur on tidal mudflats
SCOLOPACIDAE	*Calidris alba*	Sanderling	M	S	Sig	x	2			Likely to occur on tidal mudflats
SCOLOPACIDAE	*Calidris ruficollis*	Red-necked Stint	M	S	Sig	x	13			Likely to occur on tidal mudflats
SCOLOPACIDAE	*Calidris ferruginea*	Curlew Sandpiper	M	S	Sig	x	14			Likely to occur on tidal mudflats
LARIDAE	*Sternula albifrons*	Little Tern	M	E	Sig	x	12			Likely to occur foraging over waters and on mudflats
APODIDAE	*Apus pacificus*	Fork-tailed Swift	M	S		x	2			Likely to occur (flyover only)
MEROPIDAE	*Merops ornatus*	Rainbow Bee-eater	M	S		x	5			Potential to occur, foraging only
MONARCHIDAE	*Symposiarchus trivirgatus*	Spectacled Monarch	M	S		x	1			Potential to occur as a visitor to dense vegetation and mangroves
MONARCHIDAE	*Myiagra cyanoleuca*	Satin Flycatcher	M	S		x	1			Potential to occur as a visitor to mangroves
ARDEIDAE	*Egretta sacra*	Eastern Reef Egret	M	S			3			Potential to occur in mangroves
ACCIPITRIDAE	*Pandion cristatus*	Eastern Osprey	M	S	Sig		7			Likely to occur, foraging and nesting, particularly on man-

Family	Species	Common name	Status			Database source				Likelihood of Occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
										made structures
ACCIPITRIDAE	*Lophoictinia isura*	Square-tailed Kite		NT	Sig		1		Y	Potential to occur, foraging only
BURHINIDAE	*Burhinus grallarius*	Bush Stone-curlew		LC	Sig		1			Likely to occur across PDA
BURHINIDAE	*Esacus magnirostris*	Beach Stone-curlew		V	Sig		1			Potential to occur on tidal mudflats and mangroves
HAEMATOPODIDAE	*Haematopus fuliginosus*	Sooty Oystercatcher		NT	Sig		4			Potential to occur occasionally on tidal mudflats
SCOLOPACIDAE	*Tringa nebularia*	Common Greenshank	M	S	Sig		8			Likely to occur on tidal mudflats and saltmash
LARIDAE	*Thalasseus bengalensis*	Lesser Crested Tern	M	S			2			Unlikely to occur, preferred habitat not present
LARIDAE	*Chlidonias leucopterus*	White-winged Black Tern	M	S	Sig		6			Likely to occur foraging over waters and on mudflats
ACANTHIZIDAE	*Chthonicola sagittata*	Speckled Warbler		LC	Sig		4			Unlikely to occur, habitat very limited in PDA
MELIPHAGIDAE	*Anthochaera chrysoptera*	Little Wattlebird		LC	Sig		1			Likely to occur across PDA
ESTRILDIDAE	*Taeniopygia bichenovii*	Double-barred Finch		LC	Sig		5			Potential to occur in vegetated parks and bushland
DIOMEDIDAE	*Diomedea exulans*	Wandering Albatross	V,M	V		x				Unlikely to occur, pelagic species
PROCELLARIIDAE	*Macronectes giganteus*	Southern Giant-Petrel	E,M	E		x				Unlikely to occur, pelagic species
PROCELLARIIDAE	*Macronectes halli*	Northern Giant-Petrel	V,M	V		x				Unlikely to occur, pelagic species
PROCELLARIIDAE	*Pterodroma neglecta*	Kermadec Petrel (Western)	V	LC		x				Unlikely to occur, pelagic species
PROCELLARIIDAE	*Ardenna carneipes*	Flesh-footed Shearwater	M	S		x				Unlikely to occur, pelagic species
ARDEIDAE	*Botaurus poiciloptilus*	Australasian Bittern		LC		x				Potential to occur in drain tussocks and occasionally saltmarsh
ARDEIDAE	*Ardea ibis*	Cattle Egret	M	S		x				Potential to occur in paddocks and tidal mudflats

Family	Species	Common name	Status			Database source				Likelihood of Occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
ACCIPITRIDAE	*Erythrotriorchis radiatus*	Red Goshawk	V	E		x				Potential to occur, as a rare visitor, foraging only
TURNICIDAE	*Turnix melanogaster*	Black-breasted Button-quail	V	V		x				Unlikely to occur, habitat not present in PDA
CHARADRIIDAE	*Charadrius veredus*	Oriental Plover	M	S		x				Potential to occur on tidal mudflats
ROSTRATULIDAE	*Rostratula australis*	Australian Painted Snipe	E,M	V		x			Y	Potential to occur in dense vegetation bordering wetlands/ waterbodies
SCOLOPACIDAE	*Limosa limosa*	Black-tailed Godwit	M	S		x				Likely to occur on tidal mudflats
SCOLOPACIDAE	*Tringa glareola*	Wood Sandpiper	M	S		x				Likely to occur in mangroves, saltmarsh and tidal mudflats
SCOLOPACIDAE	*Limicola falcinellus*	Broad-billed Sandpiper	M	S		x				Likely to occur on tidal mudflats
PSITTACIDAE	*Lathamus discolor*	Swift Parrot	E	E		x				Potential to occur, foraging only
PSITTACIDAE	*Cyclopsitta diophthalma coxeni*	Double-eyed Fig-Parrot (Coxen's)	E,M	E		x				Unlikely to occur due to rarity
APODIDAE	*Hirundapus caudacutus*	White-throated Needletail	M	S		x				Potential to occur as flyover only
DASYORNITHIDAE	*Dasyornis brachypterus*	Eastern Bristlebird	E	E		x				Unlikely to occur as habitat not present
MELIPHAGIDAE	*Anthochaera phrygia*	Regent Honeyeater	E,M	E		x				Potential to occur as a rare visitor, foraging only
RHIPIDURIDAE	*Rhipidura rufifrons*	Rufous Fantail	M	S		x				Potential to occur in vegetated areas
MONARCHIDAE	*Monarcha melanopsis*	Black-faced Monarch	M	S		x				Potential to occur as a rare visitor, foraging only
DIOMEDIDAE	*Diomedea antipodensis antipodensis*	Antipodean Albatross	V,M	V		x				Unlikely to occur, pelagic species
DIOMEDIDAE	*Diomedea antipodensis gibsoni*	Gibson's Albatross	V,M	V		x				Unlikely to occur, pelagic species
ESTRILDIDAE	*Poephila cincta cincta*	Black-throated Finch (Southern subsp)	E	E	Sig	x				Unlikely to occur as habitat not present

Family	Species	Common name	Status			Database source				Likelihood of Occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
MAMMALS										
PHASCOLARCTIDAE	*Phascolarctos cinereus (SEQ Bioregion)*	Koala (SEQ Bioregion)	V	V	Sig	x	365			Known to occur in koala habitat trees across PDA
PTEROPODIDAE	*Pteropus poliocephalus*	Grey-headed Flying-fox	V	LC	Sig	x				Known to occur, foraging only
DASYURIDAE	*Dasyurus hallucatus*	Northern Quoll	E	LC		x				Unlikely to occur, habitat not present
DASYURIDAE	*Dasyurus maculatus maculatus*	Spotted-tailed Quoll (SE Mainland)	E	V		x				Unlikely to occur, habitat not present
POTOROIDAE	*Potorous tridactylus tridactylus*	Long-nosed Potoroo (SE Mainland)	V	V		x				Unlikely to occur due to rarity
VESPERTILIONIDAE	*Chalinolobus dwyeri*	Large Pied Bat	V	V	Sig	x				Unlikely to occur as habitat not present
MURIDAE	*Xeromys myoides*	False Water-rat	V	V		x				Unlikely to occur due to rarity and aversion to human settlements
DUGONGIDAE	*Dugong dugon*	Dugong	M	V	Sig	x				Potential to occasionally occur given known occurrence in Moreton Bay
DELPHINIDAE	*Orcinus orca*	Killer Whale	M	LC		x				Unlikely to occur, habitat not present
DELPHINIDAE	*Sousa chinensis*	Indo-Pacific Hump-backed Dolphin	M	NT		x				Potential to occur as occasional visitor
BALAENOPTERIDAE	*Balaenoptera edeni*	Bryde's Whale	M	LC		x				Unlikely to occur, habitat not present
BALAENOPTERIDAE	*Megaptera novaeangliae*	Humpback Whale	V,M	V		x				Unlikely to occur, habitat not present
REPTILES										
CHELONIIDAE	*Caretta caretta*	Loggerhead Turtle	E,M	E	Sig	x				Unlikely to occur, except as rare visitor
CHELONIIDAE	*Chelonia mydas*	Green Turtle	V,M	V	Sig	x		x		Unlikely to occur, except as rare visitor
CHELONIIDAE	*Eretmochelys imbricata*	Hawksbill Turtle	V,M	V	Sig	x				Potential to occur in mangrove fringes, however

Family	Species	Common name	Status			Database source				Likelihood of Occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
										expected to rarely visit in PDA
CHELONIIDAE	*Lepidochelys olivacea*	Pacific Ridley	E,M	E	Sig	x				Unlikely to occur, except as rare visitor
CHELONIIDAE	*Natator depressus*	Flatback Turtle	V,M	V	Sig	x				Unlikely to occur, except as rare visitor
DERMOCHELYIDAE	*Dermochelys coriacea*	Leathery Turtle	E,M	E	Sig	x				Unlikely to occur, except as rare visitor
PYGOPODIDAE	*Delma torquata*	Adorned Delma	V	V		x				Unlikely to occur as habitat not present

Conservation significant terrestrial flora species recorded or predicted to occur within a 1 km radius of the Toondah Harbour PDA and their likelihood of occurrence (known, likely, potential or unlikely) within or immediately adjoining the subject site.

Abbreviations: EPBC = status under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth); **NCA** = status under the *Nature Conservation Act 1992* (Queensland); **RCC** = status under the Redland City Council Biodiversity Strategy; **PM** = EPBC Protected Matters Search Tool database search within a 1 km radius of the study area; **WN** = Queensland Department of Environment and Resource Management WildNet database search within a 1 km radius of the study area; **HR** = Queensland Herbarium HERBRECS database search within a 1 km radius of the study area; **NEDS** = Association of species with a vegetation type present in PDA according to RCC's Natural Environment Decision Support; **E** = Endangered; **V** = Vulnerable; **NT** = Near Threatened; **M** = Migratory; **S** = Special Least Concern (Migratory or culturally significant); **LC** = Least Concern; **Sig** = RCC Significant; **X** = species occurrence predicted (PM or QM); **Y** =Species is associated with mapped vegetation (NEDS).

Family	Species	Common name	Status			Database source				Likelihood of occurrence
			EPBC	NCA	RCC	PM	WN	HR	NEDS	
POACEAE	*Arthraxon hispidus*	Hairy Joint Grass	V	V		X				Unlikely to occur as habitat not present.
LAURACEAE	*Cryptocarya foetida*	Stinking Laurel	V	V		X				Unlikely to occur as habitat not present.
ORCHIDACEAE	*Cryptostylis hunteriana*	Leafless Tongue Orchid	V	LC		X				Unlikely to occur as habitat not present.
ORCHIDACEAE	*Phaius australis*	Lesser Swamp Orchid	E	E		X				Unlikely to occur as habitat not present.
MORACEAE	*Streblus pendulinus*	Isaac Wood	E	LC		X				Unlikely to occur as habitat not present.
ORCHIDACEAE	*Taeniophyllum muelleri*	Minute Orchid	V	LC		X				Unlikely to occur as habitat not present.

APPENDIX 4

Conservation significant flora and fauna species identified in the desktop assessment and their likelihood of occurrence in the Weinam Creek PDA

Conservation significant terrestrial fauna species recorded or predicted to occur within a 1 km radius of the Weinam Creek PDA and their likelihood of occurrence (known, likely, potential or unlikely) within or immediately adjoining the subject site.

Abbreviations: EPBC = status under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth); **NCA** = status under the *Nature Conservation Act 1992* (Queensland); **RCC** = status under the Redland City Council Biodiversity Strategy; **PM** = EPBC Protected Matters Search Tool database search within a 1 km radius of the study area; **WN** = Queensland Department of Environment and Resource Management WildNet database search within a 1 km radius of the study area; **QM** = Queensland Museum database search within a 1 km radius of the study area; **NEDS** = Association of species with a vegetation type present in PDA according to RCC's Natural Environment Decision Support; **E** = Endangered; **V** = Vulnerable; **NT** = Near Threatened; **M** = Migratory; **S** = Special Least Concern (Migratory or culturally significant); **LC** = Least Concern; **Sig** = RCC Significant; **X** = species occurrence predicted (PM or QM); **Y** =Species is associated with mapped vegetation (NEDS).

Likelihood of occurrence categories: Known - from other surveys (BAAM, other consultancies, databases), species recorded onsite; **Likely to occur** – species not known to occur onsite but the site is within the known range of the species, potentially suitable habitat is present and there are either database records for the local region or knowledge of the species occurrence suggests it may occur as a resident or visitor; means 'high potential' or good habitat is present but no species were observed onsite; **Potential to occur** – the site is within the known range of the species and potentially suitable habitat is present but there are no database records for the local region and/or it is a rare, erratic or poorly known species; means 'low potential' or habitat for species is not definitive; **Unlikely to occur** – no suitable habitat present and/or the site is outside of the known range of the species.

Family	Species	Common name	Status			Database source				Likelihood of occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
AMPHIBIANS										
MYOBATRACHIDAE	*Mixophyes iteratus*	Giant Barred Frog	E	E		X				Unlikely as preferred habitat not present
BIRDS										
ARDEIDAE	*Ardea modesta*	Great Egret	M	S	Sig	X	1			Likely to occur on tidal mudflats and ponded areas
ACCIPITRIDAE	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	M	S	Sig	X	1			Likely to occur, foraging only
SCOLOPACIDAE	*Xenus cinereus*	Terek Sandpiper	M	S	Sig	X	1			Potential to occur as a rare visitor to tidal mudflats
SCOLOPACIDAE	*Calidris acuminata*	Sharp-tailed Sandpiper	M	S	Sig	X	1			Potential to occur as a rare visitor to tidal mudflats
ANSERANATIDAE	*Anseranas semipalmata*	Magpie Goose		LC	Sig		2			Unlikely to occur as preferred habitat not present

Family	Species	Common name	Status			Database source				Likelihood of occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
LARIDAE	*Hydroprogne caspia*	Caspian Tern	M	S	Sig		2			Known to occur, foraging over coastal waters and resting on mudflats
LARIDAE	*Thalasseus bergii*	Crested Tern	M	S	Sig		1			Likely to occur foraging over coastal waters and resting on mudflats
MALURIDAE	*Malurus lamberti*	Variegated Fairy-wren		LC	Sig		1			Potential to occur in shrubby vegetation
MALURIDAE	*Malurus melanocephalus*	Red-backed Fairy-wren		LC	Sig		1			Potential to occur in shrubby vegetation
ESTRILDIDAE	*Neochmia temporalis*	Red-browed Finch		LC	Sig		1			Potential to occur in vegetation across PDA
CHARADRIIDAE	*Pluvialis fulva*	Pacific Golden Plover	M	S	Sig	X				Potential to occur as a rare visitor to tidal mudflats
CHARADRIIDAE	*Pluvialis squatarola*	Grey Plover	M	S	Sig	X				Potential to occur as a rare visitor to tidal mudflats
CHARADRIIDAE	*Charadrius bicincutus*	Double-banded Plover	M	S	Sig	X				Potential to occur as a rare visitor to tidal mudflats
CHARADRIIDAE	*Charadrius mongolus*	Lesser Sand Plover	M	S	Sig	X				Potential to occur as a rare visitor to tidal mudflats
CHARADRIIDAE	*Charadrius leschenaultii*	Greater Sand Plover	M	S	Sig	X				Potential to occur as a rare visitor to tidal mudflats
SCOLOPACIDAE	*Gallinago hardwickii*	Latham's Snipe	M	S		X				Potential to occur as a rare visitor to wetland habitat in Weinam Creek
SCOLOPACIDAE	*Limosa lapponica*	Bar-tailed Godwit	M	S	Sig	X				Potential to occur as a rare visitor to tidal mudflats
SCOLOPACIDAE	*Numenius minutus*	Little Curlew	M	S	Sig	X				Unlikely to occur
SCOLOPACIDAE	*Numenius phaeopus*	Whimbrel	M	S	Sig	X				Likely to occur as an occasional visitor to tidal mudflats
SCOLOPACIDAE	*Numenius madagascariensis*	Eastern Curlew	M	NT	Sig	X			Y	Likely to occur on tidal mudflats, mangroves and saltmarsh
SCOLOPACIDAE	*Tringa stagnatilis*	Marsh Sandpiper	M	S	Sig	X				Unlikely to occur
SCOLOPACIDAE	*Actitis hypoleucos*	Common Sandpiper	M	S	Sig	X				Potential to occur as a rare visitor to tidal mudflats
SCOLOPACIDAE	*Tringa brevipes*	Grey-tailed Tattler	M	S	Sig	X				Likely to occur as an occasional visitor to tidal mudflats

Family	Species	Common name	Status			Database source				Likelihood of occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
SCOLOPACIDAE	*Arenaria interpres*	Ruddy Turnstone	M	S	Sig	X				Potential to occur as a rare visitor to tidal mudflats
SCOLOPACIDAE	*Calidris tenuirostris*	Great Knot	M	S	Sig	X				Potential to occur as a rare visitor to tidal mudflats
SCOLOPACIDAE	*Calidris canutus*	Red Knot	M	S	Sig	X				Potential to occur as a rare visitor to tidal mudflats
SCOLOPACIDAE	*Calidris alba*	Sanderling	M	S	Sig	X				Unlikely to occur; no suitable habitat
SCOLOPACIDAE	*Calidris ruficollis*	Red-necked Stint	M	S	Sig	X				Likely to occur as an occasional visitor to tidal mudflats
SCOLOPACIDAE	*Calidris ferruginea*	Curlew Sandpiper	M	S	Sig	X				Potential to occur as a rare visitor to tidal mudflats
LARIDAE	*Sternula albifrons*	Little Tern	M	E	Sig	X				Likely to occur foraging over coastal waters
APODIDAE	*Apus pacificus*	Fork-tailed Swift	M	S		X				Potential to occur as a rare visitor (flyover only)
MEROPIDAE	*Merops ornatus*	Rainbow Bee-eater	M	S		X				Likely to occur, foraging only
MONARCHIDAE	*Symposiarchus trivirgatus*	Spectacled Monarch	M	S		X				Potential to occur as a visitor to dense vegetation and mangroves
MONARCHIDAE	*Myiagra cyanoleuca*	Satin Flycatcher	M	S		X				Potential to occur as a visitor to mangroves
ARDEIDAE	*Egretta sacra*	Eastern Reef Egret	M	S						Likely to occur as an occasional visitor to tidal mudflats and mangroves
ACCIPITRIDAE	*Pandion cristatus*	Eastern Osprey	M	S	Sig					Likely to occur, foraging over coastal waters; no known nest site present within or adjoining PDA
ACCIPITRIDAE	*Lophoictinia isura*	Square-tailed Kite		NT	Sig				Y	Unlikely to occur; habitat largely unsuitable
BURHINIDAE	*Burhinus grallarius*	Bush Stone-curlew		LC	Sig					Likely to occur across PDA
BURHINIDAE	*Esacus magnirostris*	Beach Stone-curlew		V	Sig					Unlikely to occur; habitat mostly unsuitable
HAEMATOPODIDAE	*Haematopus fuliginosus*	Sooty Oystercatcher		NT	Sig					Unlikely to occur; habitat mostly unsuitable

Family	Species	Common name	Status			Database source				Likelihood of occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
SCOLOPACIDAE	*Tringa nebularia*	Common Greenshank	M	S	Sig					Unlikely to occur; habitat mostly unsuitable
LARIDAE	*Thalasseus bengalensis*	Lesser Crested Tern	M	S						Potential to occur as a rare visitor foraging over coastal waters
LARIDAE	*Chlidonias leucopterus*	White-winged Black Tern	M	S						Potential to occur as a rare visitor foraging over coastal waters
ACANTHIZIDAE	*Chthonicola sagittata*	Speckled Warbler		LC	Sig					Unlikely to occur, habitat very limited in PDA
MELIPHAGIDAE	*Anthochaera chrysoptera*	Little Wattlebird		LC	Sig					Unlikely to occur
ESTRILDIDAE	*Taeniopygia bichenovii*	Double-barred Finch		LC	Sig					Potential to occur in vegetated parks and bushland
MALURIDAE	*Malurus cyaneus*	Superb Fairy-wren		LC	Sig		2			Potential to occur in vegetated parks and bushland
DIOMEDIDAE	*Diomedea exulans*	Wandering Albatross	V,M	V		X				Unlikely to occur, pelagic species
DIOMEDIDAE	*Diomedea antipodensis antipodensis*	Antipodean Albatross	V,M	V		X				Unlikely to occur, pelagic species
DIOMEDIDAE	*Diomedea antipodensis gibsoni*	Gibson's Albatross	V,M	V		X				Unlikely to occur, pelagic species
PROCELLARIIDAE	*Macronectes giganteus*	Southern Giant-Petrel	E,M	E		X				Unlikely to occur, pelagic species
PROCELLARIIDAE	*Macronectes halli*	Northern Giant-Petrel	V,M	V		X				Unlikely to occur, pelagic species
PROCELLARIIDAE	*Pterodroma neglecta*	Kermadec Petrel (Western)	V	LC		X				Unlikely to occur, pelagic species
PROCELLARIIDAE	*Ardenna carneipes*	Flesh-footed Shearwater	M	S		X				Unlikely to occur, pelagic species
ARDEIDAE	*Botaurus poiciloptilus*	Australasian Bittern		LC		X				Potential to occur in drain tussocks and occasionally saltmarsh
ARDEIDAE	*Ardea ibis*	Cattle Egret	M	S		X				Potential to occur in open, grassy paddocks
ACCIPITRIDAE	*Erythrotriorchis radiatus*	Red Goshawk	V	E		X				Unlikely to occur, no suitable habitat

Family	Species	Common name	Status			Database source				Likelihood of occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
TURNICIDAE	*Turnix melanogaster*	Black-breasted Button-quail	V	V		X				Unlikely to occur, no suitable habitat
CHARADRIIDAE	*Charadrius veredus*	Oriental Plover	M	S	Sig	X				Potential to occur on tidal mudflats
ROSTRATULIDAE	*Rostratula australis*	Australian Painted Snipe	E,M	V		X			Y	Potential to occur in dense vegetation bordering wetlands/waterbodies
SCOLOPACIDAE	*Limosa limosa*	Black-tailed Godwit	M	S	Sig	X				Likely to occur on tidal mudflats
SCOLOPACIDAE	*Tringa glareola*	Wood Sandpiper	M	S	Sig	X				Likely to occur in mangroves and tidal mudflats
SCOLOPACIDAE	*Limicola falcinellus*	Broad-billed Sandpiper	M	S	Sig	X				Likely to occur on tidal mudflats
PSITTACIDAE	*Lathamus discolor*	Swift Parrot	E	E		X				Potential to occur, foraging only
PSITTACIDAE	*Cyclopsitta diophthalma coxeni*	Double-eyed Fig-Parrot (Coxen's)	E,M	E		X				Unlikely to occur due to rarity
APODIDAE	*Hirundapus caudacutus*	White-throated Needletail	M	S		X				Potential to occur as flyover only
DASYORNITHIDAE	*Dasyornis brachypterus*	Eastern Bristlebird	E	E		X				Unlikely to occur as habitat not present
MELIPHAGIDAE	*Anthochaera phrygia*	Regent Honeyeater	E,M	E		X				Potential to occur as a rare visitor, foraging only
RHIPIDURIDAE	*Rhipidura rufifrons*	Rufous Fantail	M	S		X				Potential to occur in vegetated areas
MONARCHIDAE	*Monarcha melanopsis*	Black-faced Monarch	M	S		X				Potential to occur as a rare visitor, foraging only
ESTRILDIDAE	*Poephila cincta cincta*	Black-throated Finch (Southern subsp)	E	E						Unlikely to occur as habitat not present
COLUMBIDAE	*Geophaps scripta scripta*	Squatter Pigeon (Southern subsp)	V	V		X				Unlikely to occur as habitat not present
MAMMALS										
PHASCOLARCTIDAE	*Phascolarctos cinereus (SEQ Bioregion)*	Koala (SEQ Bioregion)	V	V	Sig	X	49			Known to occur in koala habitat trees across PDA

Family	Species	Common name	Status			Database source				Likelihood of occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
PTEROPODIDAE	*Pteropus poliocephalus*	Grey-headed Flying-fox	V	LC	Sig	X	11			Known to occur in flying fox roost at Weinam Creek
PTEROPODIDAE	*Pteropus alecto*	Black Flying-fox		LC	Sig		25			Known to occur in flying fox roost at Weinam Creek
DASYURIDAE	*Dasyurus hallucatus*	Northern Quoll	E	LC		X				Unlikely to occur, habitat not present
DASYURIDAE	*Dasyurus maculatus maculatus*	Spotted-tailed Quoll (SE Mainland)	E	V		X				Unlikely to occur, habitat not present
POTOROIDAE	*Potorous tridactylus tridactylus*	Long-nosed Potoroo (SE Mainland)	V	V		X				Unlikely to occur due to rarity
VESPERTILIONIDAE	*Chalinolobus dwyeri*	Large Pied Bat	V	V	Sig	X				Unlikely to occur as habitat not present
MURIDAE	*Xeromys myoides*	False Water-rat	V	V		X			Y	Unlikely to occur due to rarity and aversion of human settlements
DUGONGIDAE	*Dugong dugon*	Dugong	M	V	Sig	X				Potential to occasionally occur given known occurrence in Moreton Bay
DELPHINIDAE	*Orcinus orca*	Killer Whale	M	LC		X				Unlikely to occur, habitat not present
DELPHINIDAE	*Sousa chinensis*	Indo-Pacific Hump-backed Dolphin	M	NT		X				Potential to occur as occasional visitor
BALAENOPTERIDAE	*Balaenoptera edeni*	Bryde's Whale	M	LC		X				Unlikely to occur, habitat not present
BALAENOPTERIDAE	*Megaptera novaeangliae*	Humpback Whale	V,M	V		X				Unlikely to occur, habitat not present
REPTILES										
CHELONIIDAE	*Caretta caretta*	Loggerhead Turtle	E,M	E	Sig	X				Unlikely to occur, except as rare visitor
CHELONIIDAE	*Chelonia mydas*	Green Turtle	V,M	V	Sig	X				Unlikely to occur, except as rare visitor
CHELONIIDAE	*Eretmochelys imbricata*	Hawksbill Turtle	V,M	V	Sig	X				Potential to occur in mangrove fringes, however expected to rarely visit in PDA
CHELONIIDAE	*Lepidochelys*	Pacific Ridley	E,M	E	Sig	X				Unlikely to occur, except as rare

Family	Species	Common name	Status			Database source				Likelihood of occurrence
			EPBC	NCA	RCC	PM	WN	QM	NEDS	
	olivacea									visitor
CHELONIIDAE	*Natator depressus*	Flatback Turtle	V,M	V	Sig	X				Unlikely to occur, except as rare visitor
DERMOCHELYIDAE	*Dermochelys coriacea*	Leathery Turtle	E,M	E	Sig	X				Unlikely to occur, except as rare visitor
PYGOPODIDAE	*Delma torquata*	Adorned Delma	V	V		X				Unlikely to occur as habitat not present
INSECTS										
LYCAENIDAE	*Acrodipsas illidgei*	Illidge's ant-blue	V	LC			34	X		Known from mangrove vegetation in the PDA

Conservation significant terrestrial flora species recorded or predicted to occur within a 1 km radius of the Weinam Creek PDA and their likelihood of occurrence (known, likely, potential or unlikely) within or immediately adjoining the subject site.

Abbreviations: EPBC = status under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth); **NCA** = status under the *Nature Conservation Act 1992* (Queensland); **RCC** = status under the Redland City Council Biodiversity Strategy; **PM** = EPBC Protected Matters Search Tool database search within a 1 km radius of the study area; **WN** = Queensland Department of Environment and Resource Management WildNet database search within a 1 km radius of the study area; **HR** = Queensland Herbarium HERBRECS database search within a 1 km radius of the study area; **NEDS** = Association of species with a vegetation type present in PDA according to RCC's Natural Environment Decision Support; **E** = Endangered; **V** = Vulnerable; **NT** = Near Threatened; **M** = Migratory; **S** = Special Least Concern (Migratory or culturally significant); **LC** = Least Concern; **Sig** = RCC Significant; **X** = species occurrence predicted (PM or QM); **Y** =Species is associated with mapped vegetation (NEDS).

Family	Species	Common name	Status			Record source				Likelihood of occurrence
			EPBC	NCA	RCC	PM	WN	HR	NEDS	
POACEAE	*Arthraxon hispidus*	Hairy Joint Grass	V	V		X				Unlikely to occur as habitat not present.
EUPHORBIACEAE	*Baloghia marmorata*	Marbled Balogia	V	V		X				Unlikely to occur as habitat not present.
LAURACEAE	*Cryptocarya foetida*	Stinking Laurel	V	V		X				Unlikely to occur as habitat not present.
ORCHIDACEAE	*Cryptostylis hunteriana*	Leafless Tongue Orchid	V	LC		X				Unlikely to occur as habitat not present.
ORCHIDACEAE	*Phaius australis*	Lesser Swamp Orchid	E	E		X			Y	Potential to occur in the southern portion of the PDA, in association with *Melaleuca quinquenervia* forest RE12.3.5; however, this species was not located during the field survey and is considered unlikely to occur.
MORACEAE	*Streblus pendulinus*	Isaac Wood	E	LC		X				Unlikely to occur as habitat not present.
ORCHIDACEAE	*Taeniophyllum muelleri*	Minute Orchid	V	LC		X				Unlikely to occur as habitat not present.

Attachment 2

Proposed Work Locations Photos and Descriptions

Weinam Creek Precinct 1 – Marine Permit

Table 1 - Site Photos and Brief Descriptions

Site No.	Photos and Descriptions of Locations	
1	Highly altered area within the General Use zone. This area immediately adjoins the existing mooring and the police Jetty. The embarkment is entirely constructed with a concrete surface. The existing storm water outlet can be seen in photos. This The intent is to upgrade this outlet. The proposed upgraded outlet is entirely within the existing revetment wall located within Weinam Creek Harbor. .	
		
	View looking east	View Looking west
2	Highly altered area within the General Use zone. This area immediately adjoins existing car parking uses. The existing outlet is indiscernible and is within the Rocked embankment. The intent is to upgrade this existing outlet. The proposed upgraded outlet will also be entirely within the existing revetment wall. Marine muds adjoin the rock wall interface.	
		
	View looking east	View looking west

Site No.	Photos and Descriptions of Locations	
		
	View north of works area and Carpark behind	View south over works area showing the Weinam creek harbor entrance channel.
3	Site 3 is the location of a proposed new storm water outlet. This outlet will be on the immediate edge between the General use and habitat protection zones. There is an existing stormwater outlet proximate to the south. This is a highly altered area with rock wall revetment. The proposed new outlet will be entirely within the existing revetment wall.	
		
	View looking north over proposed works area of Site 3.	View looking east from top of existing revetment wall.

Site No.	Photos and Descriptions of Locations	
		
	View looking east from top of embankment over existing storm water outlet to the south. The outlet is entirely contained within the revetment as is proposed for the new outlet at Site 3.	View looking east from top over existing storm water outlet located nearby the proposed works area.
4	Site 4 is the proposed location for terraced access from the top of the revetment wall. This location is already used by the public to access the water or foreshore areas. The proposed terraces are to formalise this use. This location is at the junction of two rock revetment walls immediately adjacent to the ferry terminal. There is a small bank of sand in the immediate intertidal zone and a mix of marine mud and rocks further east.	
		
	View looking north over proposed terrace location. showing the small sand area in this location.	View looking south towards the proposed location for access terraces.

Site No.	Photos and Descriptions of Locations	
		
	Looking west at proposed terrace location.	Looking east over proposed terrace location.
5	Site 5 is the proposed location for the 2nd terrace. This location is also used by the public to access the water or foreshore areas. The proposed terraces are designed to formalise this use and provide safe viewing areas. There are Moreton Bay Rock Oysters *Saccostrea glomerata* within the rock revetment wall in this location. The majority of these had been removed, though there were some living specimens remaining. The substrate immediately against the rock revetment is primarily comprised of marine mud with occasional small rocks. Benthic and invertebrate activity was very low.	
		
	Looking west from intertidal zone at proposed terraced access location.	Looking east over proposed stair access location from existing walkway. Vegetation in view are exotic grasses along the existing walkway

Site No.	Photos and Descriptions of Locations
	
	Looking east showing the presence of Rock Oysters.