

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





#### **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.

#### **Draft Preparation History:**

Draft No.	Date draft	Reviewed by	Issued by
	completed		
0015-063 Draft A	20/12/2013	Jedd Appleton, Adrian Caneris and Simon Walker	Jedd Appleton

#### Revision/ Checking History Track:

Version	Date of Issue	Checked by	Issued by
0015-063 Version 0	17/01/2014	Adrian Caneris	Jo Chambers

#### **Document Distribution:**

Destination	Rev	Revision						
	1	Date	2	Date	3	Date	4	Date
		Dispatched		Dispatched		Dispatched		Dispatched
Client Copy 1 -	Α	20/12/2013	0	17/01/2014				
digital								
Client Copy 1-								
hard copy								
PDF - server	Α	20/12/2013	0	17/01/2014				
PDF – backup –	Α	20/12/2013	0	17/01/2014				
archived Disk/tape								
Hard Copy -library								

#### NOTICE TO USERS OF THIS REPORT

#### Copyright and reproduction

This report and all indexes, schedules, annexures or appendices are subject to copyright pursuant to the Copyright Act 1968 (Cth). Subject to statutory defences, no party may reproduce, publish, adapt or communicate to the public, in whole or in part, the content of this report without the express written consent of Biodiversity Assessment and Management Pty Ltd.

#### 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.

This report has been produced solely for the benefit of the Client. Biodiversity Assessment and Management Pty Ltd does not accept that a duty of care is owed to any party other than the Client. This report is not to be used by any third party other than as authorised in writing by Biodiversity Assessment and Management Pty Ltd and any such use shall continue to be limited to the Specified Purpose. Further, Biodiversity Assessment and Management Pty Ltd does not make any warranty, express or implied, or assume any legal liability or responsibility for any third party's use in whole or in part of the report or application or use of any other information or process disclosed in this report and to the full extent allowed by law excludes liability in contract, tort or otherwise, for any loss or damage sustained by any person or body corporate arising from or in connection with the supply or use of the whole part of the report through any cause whatsoever.

Biodiversity Assessment and Management Pty Ltd has used information provided to it by the Client and governmental registers, databases, departments and agencies in the preparation of this report. Biodiversity Assessment and Management Pty Ltd does not know, nor does it have any reason to suspect, that the information provided to it was false, inaccurate, incomplete or misleading at the time of its receipt. This report is supplied on the basis that while Biodiversity Assessment and Management Pty Ltd believes all the information in it is deemed reliable at the time of publication, it does not warrant its accuracy or completeness and to the full extent allowed by law excludes liability in contract, tort or otherwise, for any loss or damage sustained by any person or body corporate arising from or in connection with the supply or use of the whole or any part of the information in this report through any cause whatsoever.

Date: 17<sup>th</sup> January, 2014

Signed on behalf of

**Biodiversity Assessment and Management Pty Ltd** 

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

#### Table of Contents

1.0	INIR	ODUCTION	1
	1.1	Background	1
	1.2	Project Objectives	
	1.3	Project Scope	
	1.4	Study Areas	
		1.4.1 Toondah Harbour PDA	2
		1.4.2 Weinam Creek PDA	
	1.5	Statutory Framework	
	1.0	1.5.1 Commonwealth legislation	
		1.5.2 State legislation	
		1.5.3 Redlands Planning Scheme 2006	
		•	
2.0	PRO	JECT APPROACH AND METHODS	
	2.1	Stage 1 – Project inception and mobilisation	10
	2.2	Stage 2 – Technical investigation and analysis, generation of draft options	10
		2.2.1 Literature Review	10
		2.2.2 Marine Ecology Field Surveys	11
		2.2.3 Terrestrial Ecology Field Surveys	11
		2.2.4 Reporting and Contribution to Options	11
	2.3	Stage 3 - Scenario Development, Testing and Development of Preferred Scenario	
	2.4	Stage 4 – Draft Development Scheme and Infrastructure Plan	
• •	=>//0		
3.0		TING ENVIRONMENT	
	3.1	Matters of National Environmental Significance	
		3.1.1 World Heritage Properties	
		3.1.2 National Heritage Places	
		3.1.3 Wetlands of International Importance	12
		3.1.4 Listed Threatened Species and Ecological Communities	
		3.1.5 Listed migratory species	
		3.1.6 Commonwealth marine environment	
	3.2	Matters of State Environmental Significance	
		3.2.1 Protected Area Estates	
		3.2.2 Marine Parks	
		3.2.3 Marine Plants and Declared Fish Habitat Areas	
		3.2.4 Threatened and Near Threatened Species	
		3.2.5 Regulated Vegetation	
		3.2.6 High Conservation Value Wetlands	
		3.2.7 Legally Secured Offset Areas	
	3.3	Matters of Local Environmental Significance	34
		3.3.1 Locally Significant Vegetation	
		3.3.2 Koalas, Koala habitat and non-juvenile habitat trees	
		3.3.3 Locally significant native species and their habitats	
		3.3.4 Foreshores, Wetlands and Waterways	
		3.3.5 Council Reserves	
		3.3.6 Conservation Management Priorities	
		<u> </u>	



4.0	PRE	FERRED S	TRUCTURE PLANS	39
			Harbour PDA	
		4.1.1	Ecological Benefits	39
		4.1.2	Legislative Considerations	40
	4.2	Weinam (	Creek PDA	42
		4.2.1	Ecological Benefits	42
			Legislative Considerations	
5.0	RFF	FRENCES		47

#### Table of Figures

- Figure 1.1a: Location of the Toondah Harbour PDA within Redland City
- Figure 1.1b: Location of the Weinam Creek PDA within Redland City
- Figure 3.1: Matters of National Environmental Significance within the Toondah Harbour PDA
- Figure 3.2: Matters of National Environmental Significance within the Weinam Creek PDA
- Figure 3.3: Grey-headed Flying-fox numbers present at the Weinam Creek flying-fox camp over the period July 2007 to May 2013
- Figure 3.4: Matters of State Environmental Significance within the Toondah Harbour PDA
- Figure 3.5: Matters of State Environmental Significance within the Weinam Creek PDA
- Figure 3.6: Ecological Values under State Government Legislation within Toodah Harbour PDA
- Figure 3.7: Ecological Values under State Government Legislation within Weinam Creek PDA
- 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
- Figure 3.9: Matters of Local Environmental Significance within the Toondah Harbour PDA
- Figure 3.10: Matters of Local Environmental Significance within the Toondah Harbour PDA

#### Table of Appendices

Appendix 1: EPBC Act Protected Matters Search Tool Results and Wildlife Online Database Search Results for Toondah Harbour PDA

Appendix 2: EPBC Act Protected Matters Search Tool Results and Wildlife Online Database Search Results for Weinam Creek PDA

Appendix 3: Conservation significant flora and fauna species identified in the desktop assessment and their likelihood of occurrence in the Toondah Harbour PDA

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

BAAM Pty Ltd Page ii



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

BAAM Pty Ltd Page iii





#### 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.
- 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).

153°20'E BIRKDALE WELLINGTON POINT PEEL ISLAND ORMISTON TOONDAH HARBOUR CLEVELAND PDA ALEXANDRA HILLS CAPALABA THORNLANDS **VICTORIA POINT** COOCHIEMUDLO ISLAND

Figure: 1.1a

> Title: Location of the Toondah Harbour

Priority Development Area (PDA)

Project:

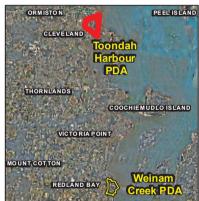
Ecological and Coastal Processes Advice: Toondah Harbour and Weinam Creek PDAs

Redland City Council Client:

**LEGEND** 

PD A 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.

Coordina te System: GCS GD A 1994 Datu m: GDA 1994 Units: Degree

1:40,000 at A3

0 0.1750.35 0.7

Date: 16/01/2014 Drawn By: MG

© Biodiversity Assessment and Management Pty Ltd. While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all fability (including without limitation liability in negligence) for all expenses, losses, damages (including) indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.



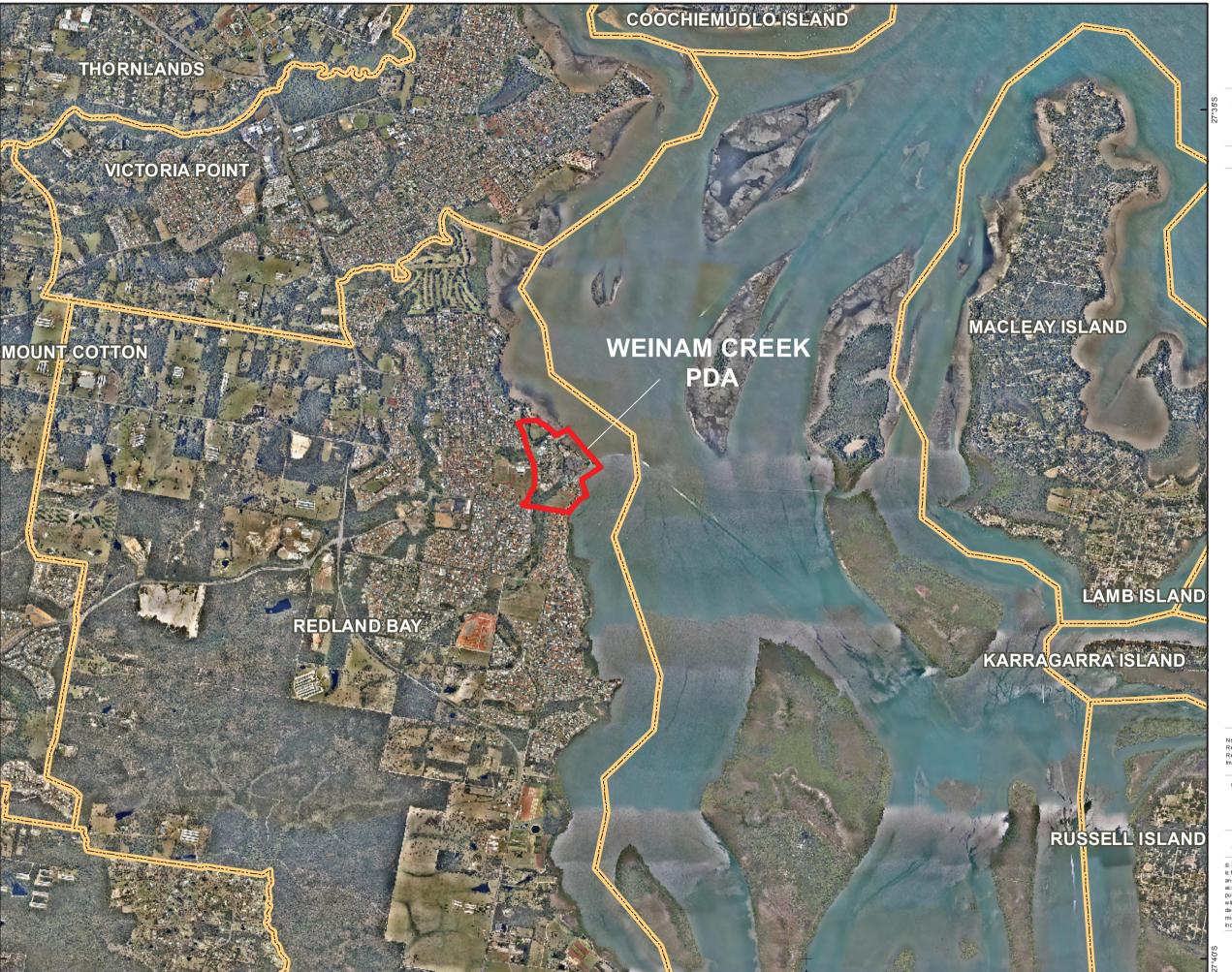


Figure: 1.1b

Title: Location of the

Weinam Creek Priority Development

Area (PDA)

Ecological and Coastal Processes Advice: Project: Toondah Harbour and

Weinam Creek PDAs

Redland City Council Client:

**LEGEND** 

PD A 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.

Coordina te System: GCS GD A 1994 Datu m: GDA 1994 Units: Degree

1:40,000 at A3

0 0.1750.35 0.7 1.05

Date: 16/01/2014 Drawn By: MG

© Biodiversity Assessment and Management Pty Ltd. While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all fability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being laccurate or incomplete in any way and for any reason.







#### 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 deregulation 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;
- 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 2<sup>nd</sup> 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 5<sup>th</sup> and 8<sup>th</sup> 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 5<sup>th</sup> 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 southwestern 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:

Matters of National

Environmental Significance within Toondah Harbour PDA

**Ecological and Coastal** 

Processes Advice: Toondah Harbour and Weinam Creek PDAs

Redland City Council Client:

#### **LEGEND**

#### Koala Food Trees:

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

1:7,000 at A3

Date: 18/12/2013 Drawn By: MG

© Biodiversity Assessment and Management Pty Ltd. While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.





3.2 Figure:

Matters of National Environmental

Significance within Weinam Creek PDA

Project:

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

Redland City Council

#### **LEGEND**

#### **Koala Food Trees:**

- Primary
- Secondary
- Other

#### Habitat

Seagrass

Flying Fox Camp

ecological community

Potential Illidges' Ant Blue Butterfly

RE 12.1.2 - Potential Subtropical & Temperate Coastal Saltmarsh

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.

Coordina te System: GCS GD A 1994 Datu m: GDA 1994 Units: Degree

1:4,740 at A3

Date: 18/12/2013 Drawn By: MG

© Biodiversity Assessment and Management Pty Ltd. While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including) indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.







#### 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	С	Likely	Known
Caretta caretta	Loggerhead Turtle	E,M	Е	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	М	S	Potential	Potential
Charadrius bicincutus	Double-banded Plover	М	S	Likely	Potential
Charadrius mongolus	Lesser Sand Plover	М	S	Likely	Potential
Charadrius leschenaultii	Greater Sand Plover	М	S	Likely	Potential
Gallinago hardwickii	Latham's Snipe	М	S	Unlikely	Potential





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

Page 17 BAAM Pty Ltd





#### **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/guidelin e/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 Flyingfox 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 Greyheaded 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.





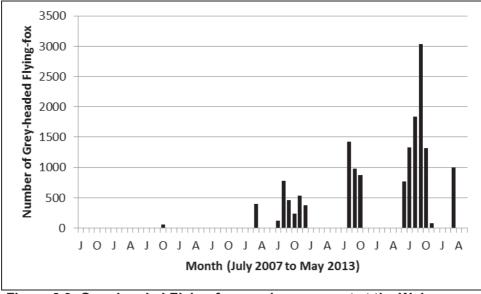


Figure 3.3. Grey-headed Flying-fox numbers present at the Weinam Creek flying-fox camp over the period July 2007 to May 2013 (Source of count data: Queensland Department of Environment and Heritage Protection).

#### 3.1.4 Listed migratory species

The desktop assessment identified 63 EPBClisted 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

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

Client: Redland City Council

#### Legend

Priority Development Areap

100NDAH HARBOUR PDA

#### Cadastre

Cadastre

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

MSFS - Protected area



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

Date: 20/01/2014 Drawn By: MG

© Biodiversity Assessment and Management Pty Ltd. While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.





Figure: 3.5

Title: State Planning Policy Matters of State

Environmental Significance Weinam Creek PDA

**Ecological and Coastal** Project: 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



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

Date: 20/01/2014 Drawn By: MG

© Biodiversity Assessment and Management Pty Ltd. While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all lilability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.







## 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	Е	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	Е	Unlikely	Unlikely
Natator depressus	Flatback Turtle	V,M	V	Unlikely	Unlikely
Dermochelys coriacea	Leathery Turtle	E,M	Е	Unlikely	Unlikely
Numenius madagascariensis	Eastern Curlew	M	NT	Known	Likely
Sternula albifrons	Little Tern	M	Е	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.

<u>Eastern Curlew:</u> 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.

<u>Little Tern:</u> 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

<u>Koala:</u> 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.

<u>Eastern Curlew:</u> 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.

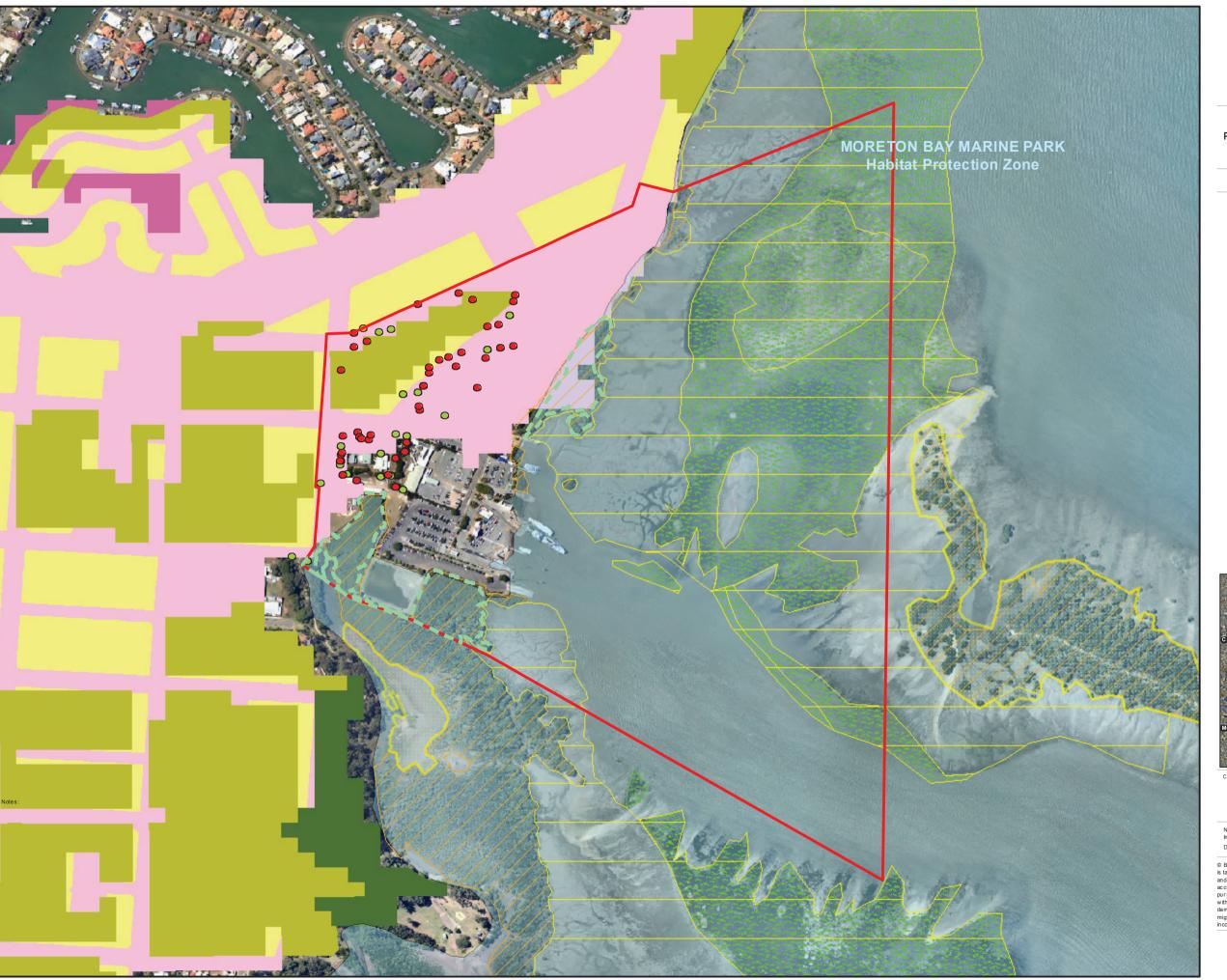


Figure:

Ecological values under State Government Legislation within Toondah Harbour PDA

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

Client:

Redland City Council

#### **LEGEND**

#### Koala Food Trees:

#### Primary

Other

#### Habitat

Seagrass

Mang rove s

Migratory Shorebird Foraging Habitat

Migratory Shorebird Roost Sites

Habitat Protection Zone

#### KOALA PLANNING AREAS v1p2

**Bushland Habitat** 

High Value Bu shland

Suitable for Rehabilitation

High Value Reha bilitation Medium Value Rehabilitation

Other Areas of Value

High Value Other

Medium Value Other

#### Regulated Vegetation

Of Least Concern RE

PDA Boundary



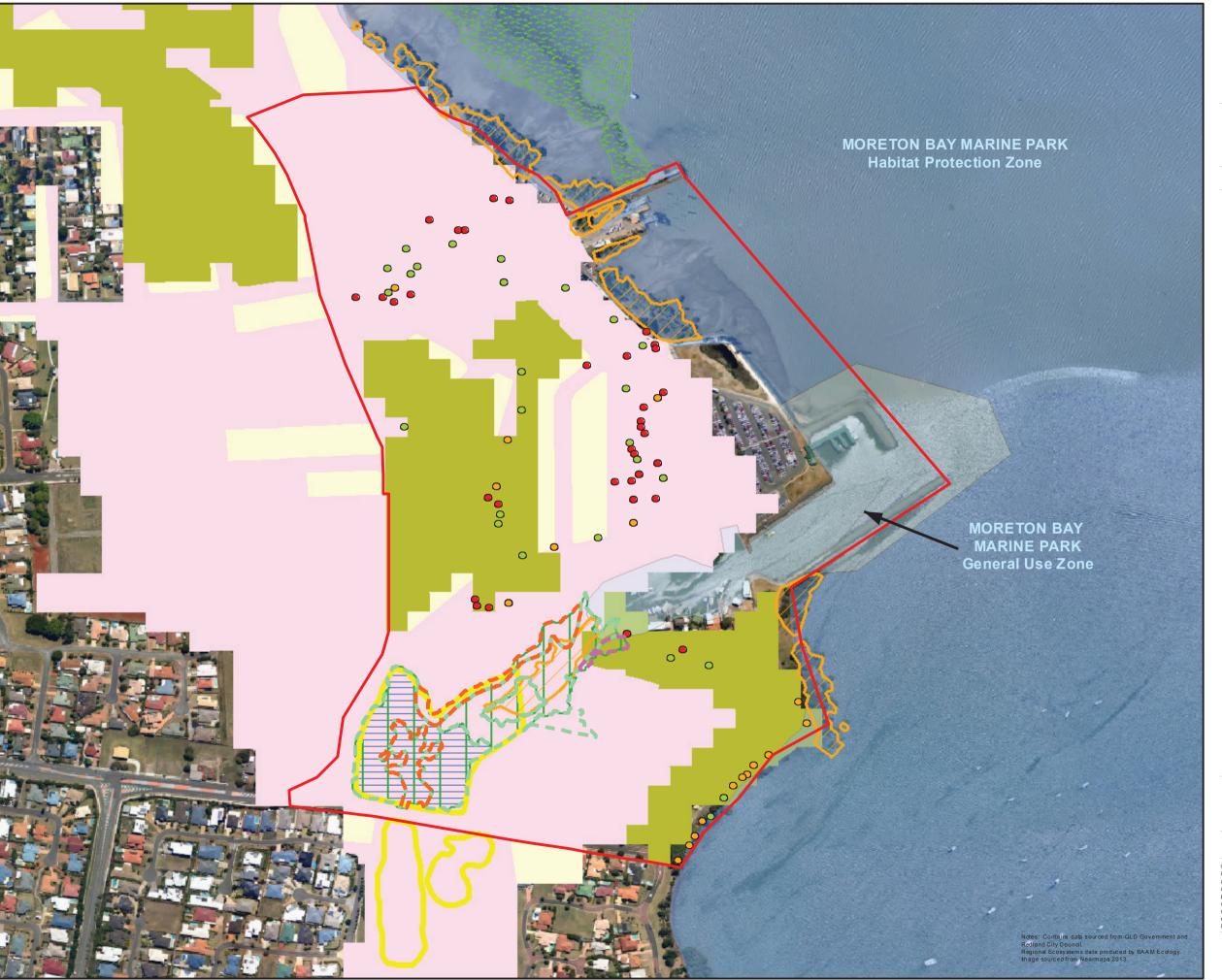
1:6,210 at A3

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

Date: 16/01/2014 Drawn By: MG

© Biodiversity Assessment and Management Pty Ltd. While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which mightbe incurred as a result of the data being haccurate or incomplete in any way and for any reason.





3.7 Figure:

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

Other

Flying Fox Camp Potential Illidges' Ant Blue Butterfly

Se agrass

Mangroves Wallum froglet - Ess ential 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



Coordina te System: GCS GD A 1994 Datu m: G DA 1994 Units: Degree

1:4,740 at A3

Date: 16/01/2014 Drawn By: MG

© Biodiversity Assessment and Management Pty Ltd. While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.







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 flyingfoxes of three species: Black Flying-fox, Greyheaded 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 flyingfoxes 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).

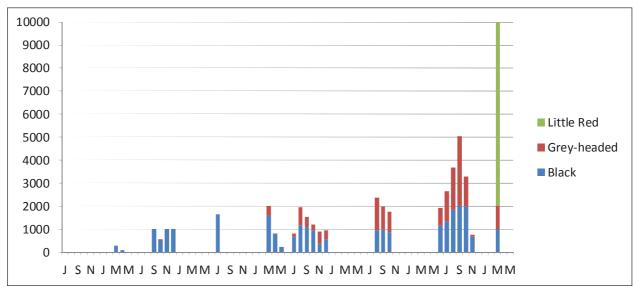


Figure 3.8. Numbers of Black, Grey-headed and Little Red flying-foxes present at the Weinam Creek flying-fox camp over the period July 2007 to May 2013 (Source of count data: Queensland Department of Environment and Heritage Protection).





### 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 Greyheaded 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 groundtruthing 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

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 nonjuvenile 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

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

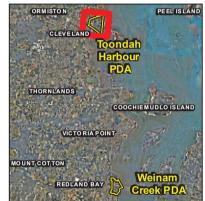
Major Foreshore

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.

1:5,478 at A3

© Biodiversity Assessment and Management Pty Ltd. While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which mightbe incurred as a result of the data being haccurate or incomplete in any way and for any reason.





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

PD A 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.

Coordina te System: G CS GD A 1994 Datu m: G DA 199 4 Units: Degree

1:4,740 at A3

0 0.020.04 0.08 0.12 0.16

Date: 16/01/2014 Drawn By: MG

Reviewed by: P

© Biodiversity Assessment and Management Pty Ltd. While every care is taken to ensure the accuracy of this data. Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any paricular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.







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

areas.		Weinam
Species	Toondah	Ck
Fauna		
Frogs		
Tusked Frog	Unlikely	Potential
Adelotus brevis	Officely	1 Oteritiai
Clicking Froglet	Potential	Likely
Crinia signifera	- Otoritian	Lintoly
Common Green Tree	Known	Likely
Frog Litoria caerulea	_	- ,
Bleating Tree Frog	Unlikely	Potential
Litoria dentata Peron's Tree Frog		
Litoria peronii	Unlikely	Likely
Great Broodfrog		
Pseudophryne major	Unlikely	Potential
Copper-backed		
Broodfrog	Unlikely	Potential
Pseudophryne raveni		. 5.5
Reptiles		1
Friendly Sunskink		
Lampropholis amicula	Unlikely	Potential
Lace Monitor		
Varanus varius	Potential	Potential
Birds		1
Magpie Goose		
Anseranas	Unlikely	Potential
semipalmata	Ormitery	1 Oteritian
Little Wattlebird		
Anthochaera	Unlikely	Potential
chrysoptera		
Bush Stone Curlew	1.6	1.6
Burhinus grallarius	Known	Known
White-bellied Sea		
Eagle	Likely	Likely
Haliaeetus leucogaster		
Wandering Tattle	Potential	Potential
Heteroscelus incanus	(marine)	(marine)
Variegated Fairy-wren	Potential	Potential
Malurus lamberti	1 Oteritiai	rotential
Red-backed Fairy-		
wren Malurus	Likely	Likely
melanocephalus		
Red-browed Finch	Potential	yes
Neochmia temporalis	. 0101111011	
Little Curlew	Potential	Potential
Numenius minutus	(marine)	(marine)
Osprey	yes	yes
Pandion haliaetus	,	,
Double-barred Finch	Potential	Likely
Taeniopygia bichenovii		1 ,
Mammals		
Large-footed Myotis	Potential	Potential
Myotis macropus	· Contian	· Storition

Species	Toondah	Weinam Ck
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)
FIG	ora	
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 1 4 1

### **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 Greyheaded 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.





### 5.0 REFERENCES

- Clemens, R.S., Haslem, A., Oldland, J., Shelley, L., Weston, M.A. and Diyan, M.A.A. (2008). Identification of significant shorebird areas in Australia: Mapping, thresholds and criteria. Birds Australia report to the Australian Government's Department of Environment and Water Resources.
- Couchman, D. & Beumer, J., 2007,
  Management and protection of marine
  plants and other tidal fish habitats:
  departmental assessment procedures and
  policy, FHMOP 001, Queensland
  Department of Primary Industries and
  Fisheries, Fish Habitat Management
  Operational Policy, pp. 70.
- Couper, P. (1998). Marine Reptiles, In: Wild Guide to Moreton Bay: Wildlife and Habitats of a Beautiful Australian Coast- Noosa to the Tweed, Ryan, R. (Ed). Queensland Museum, Brisbane.
- **DEHP (2013).** A new approach to managing flying-fox roosts: discussion paper. May 2013. Department of Environment and Heritage Protection, Brisbane.
- **Deicke Richards (2013a).** Toondah Harbour Priority Development Area Draft Structure Plan Report. Deicke Richards, Brisbane.
- **Deicke Richards (2013b).** Weinam Creek Priority Development Area Draft Structure Plan Report. Deicke Richards, Brisbane.
- **DERM (2010).** South East Queensland Koala Conservation State Planning Regulatory Provisions. Department of Environment and Resource Management, Brisbane.
- **DERM (2011).** Queensland Biodiversity Offset Policy. Department of Environment and Resource Management, Brisbane.
- **DERM (2012).** Koala Coast Koala Population Report 2010. Department of Environment and Resource Management, Brisbane.
- **DEWHA (2009a).** EPBC Act Policy Statement 1.1 – Significant Impact Guidelines for Matters of National Environmental Significance. Commonwealth Department of

- the Environment, Water, Heritage and Arts, Canberra.
- **DEWHA (2009b).** EPBC Act Policy Statement 3.21 Significant Impact Guidelines for 36 Migratory Shorebird Species.

  Commonwealth Department of the Environment, Water, Heritage and Arts, Canberra.
- **DSEWPaC (2012).** Interim Koala referral advice for proponents. Department of Sustainability, Environment, Water, Population and Communities, Canberra.
- DSEWPaC (2013a). Directory of Important Wetlands in Australia: Moreton Bay Aggregation QLD134. Department of Sustainability, Environment, Water, Population and Communities, Canberra.
- DSEWPaC (2013b). Australian Ramsar Wetlands: Moreton Bay - Australian Ramsar site 41. Department of Sustainability, Environment, Water, Population and Communities, Canberra.
- Groom, R. A., Lawler, I. R., Marsh, H. 2004, The Risk to Dugongs of Vessel Strike in the Southern Bay Islands Area of Moreton Bay, James Cook University, Townsville.
- Hazel, J., Lawler, I. R., & Hamann, M. (2009). Diving at the shallow end: green turtle behaviour in near-shore foraging habitat. Journal of Experimental Marine Biology and Ecology, 371(1), pp 84-92.
- **Lanyon, J.M. (2003).** Distribution and abundance of dugongs in Moreton Bay, Queensland, Australia. Wildlife Research 30: pp 397-409.
- Lee, K.E., Seddon, J.M., Corley, S., Ellis, W.A.H., Johnston, S.D., de Villiers, D.L., Preece, H.J. and Carrick, F.N. (2010). Genetic variation and structuring in the threatened koala populations of Southeast Queensland reveals a genetically distinct population in the Koala Coast. Conservation Genetics 11: 2091-2103.
- Limpus, C. J. (1998). Overview of Marine Turtle Conservation and Management in Australia. In: Kennett, R., Webb, A., Duff, G., Guinea, M. and Hill, G. (Eds). Marine





Turtle Conservation and Management in Northern Australia. Northern Territory University, Darwin pp 1 – 8.

**TSSC (2013).** Draft Conservation Advice (including Listing Advice) for Subtropical and Temperate Coastal Saltmarsh. Threatened Species Scientific Committee.

ULDA (2012). Environmental values and sustainable resource use. UDLA Guideline no. 14. June 2012. <a href="http://www.dsdip.qld.gov.au/resources/priority-development-areas-guidelines-and-practice-notes.html">http://www.dsdip.qld.gov.au/resources/priority-development-areas-guidelines-and-practice-notes.html</a> accessed 18-12-13

### **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 <u>Environment Assessments</u> and the EPBC Act including significance guidelines, forms and application process details.

Report created: 28/06/13 14:26:27

**Summary** 

**Details** 

Matters of NES
Other Matters Protected by the EPBC Act
Extra Information

Caveat

<u>Acknowledgements</u>



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 <u>Administrative Guidelines on Significance</u>.

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 <a href="heritage values">heritage values</a> 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 <u>permit</u> 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
<u>Dasyornis brachypterus</u>		
Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
<u>Diomedea exulans antipodensis</u>		
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
<u>Diomedea exulans gibsoni</u>		
Gibson's Albatross [82271]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans (sensu lato)		
Wandering Albatross [1073]  Erythrotriorchis radiatus	Vulnerable	Species or species habitat may occur within area
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-	Vulnerable	Species or appoins
bellied Storm-Petrel (Australasian) [64438]	vuinerable	Species or species habitat likely to occur
, , , , , , , , , , , , , , , , , , , ,		within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species
Swiit Fariot [144]	Lildangered	habitat may occur within
		area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species
Southern Glant-Fetter [1000]	Endangered	habitat may occur within
		area
Macronectes halli	Vulnerable	Charles ar anasias
Northern Giant-Petrel [1061]	Vuillerable	Species or species habitat may occur within
		area
Poephila cincta cincta  Rlack throated Finch (couthorn) [64447]	Endangered	Species or appoies
Black-throated Finch (southern) [64447]	Endangered	Species or species habitat may occur within
		area
Pterodroma neglecta neglecta  Kormadaa Patral (western) [64450]	Vulnoroble	Charles or anasis -
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	Vulnerable	Species or species
[68449]	Vuillerable	habitat may occur within
		area
Frogs Mixophyes iteratus		
Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species
-5,		habitat may occur within
Mammals		area
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species
		habitat may occur within
<u>Dasyurus hallucatus</u>		area
Northern Quoll [331]	Endangered	Species or species
	-	habitat may occur within
Dasyurus maculatus maculatus (SE mainland populat	ion)	area
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll	Endangered	Species or species
(southeastern mainland population) [75184]	-	habitat may occur within
Eubalaena australis		area
Southern Right Whale [40]	Endangered	Species or species
Southern Right Whale [40]	Endangered	Species or species habitat likely to occur
	Endangered	
Megaptera novaeangliae	Endangered  Vulnerable	habitat likely to occur within area
	•	habitat likely to occur within area  Congregation or aggregation known to
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	habitat likely to occur within area  Congregation or
Megaptera novaeangliae Humpback Whale [38]  Phascolarctos cinereus (combined populations of Qld,	Vulnerable	habitat likely to occur within area  Congregation or aggregation known to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable  NSW and the ACT)	habitat likely to occur within area  Congregation or aggregation known to

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		area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Caretta caretta Loggerhead Turtle [1763]  Chelonia mydas Green Turtle [1765]	Endangered Vulnerable	Breeding known to occur
Caretta caretta Loggerhead Turtle [1763]  Chelonia mydas Green Turtle [1765]  Delma torquata Collared Delma [1656]	-	Breeding known to occur within area  Foraging, feeding or related behaviour known
Caretta caretta Loggerhead Turtle [1763]  Chelonia mydas Green Turtle [1765]  Delma torquata	Vulnerable	Breeding known to occur within area  Foraging, feeding or related behaviour known to occur within area  Species or species habitat may occur within
Caretta caretta Loggerhead Turtle [1763]  Chelonia mydas Green Turtle [1765]  Delma torquata Collared Delma [1656]  Dermochelys coriacea	Vulnerable Vulnerable	Breeding known to occur within area  Foraging, feeding or related behaviour known to occur within area  Species or species habitat may occur within area  Species or species habitat known to occur
Caretta caretta Loggerhead Turtle [1763]  Chelonia mydas Green Turtle [1765]  Delma torquata Collared Delma [1656]  Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]  Eretmochelys imbricata	Vulnerable  Vulnerable  Endangered	Breeding known to occur within area  Foraging, feeding or related behaviour known to occur within area  Species or species habitat may occur within area  Species or species habitat known to occur within area  Foraging, feeding or related behaviour known
Caretta caretta Loggerhead Turtle [1763]  Chelonia mydas Green Turtle [1765]  Delma torquata Collared Delma [1656]  Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]  Eretmochelys imbricata Hawksbill Turtle [1766]  Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]  Natator depressus Flatback Turtle [59257]	Vulnerable  Vulnerable  Endangered  Vulnerable	Breeding known to occur within area  Foraging, feeding or related behaviour known to occur within area  Species or species habitat may occur within area  Species or species habitat known to occur within area  Foraging, feeding or related behaviour known to occur within area  Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]  Chelonia mydas Green Turtle [1765]  Delma torquata Collared Delma [1656]  Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]  Eretmochelys imbricata Hawksbill Turtle [1766]  Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]  Natator depressus	Vulnerable  Vulnerable  Endangered  Vulnerable  Endangered	Breeding known to occur within area  Foraging, feeding or related behaviour known to occur within area  Species or species habitat may occur within area  Species or species habitat known to occur within area  Foraging, feeding or related behaviour known to occur within area  Species or species habitat known to occur within area  Species or species habitat known to occur within area  Foraging, feeding or related behaviour known

Name	Status	Type of Presence
Pristis zijsron		area
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  * Species is listed under a different scientific name or	n the EPBC Act - Threat	[ Resource Information
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	V 1 l l . *	O a situation and a situation
Antipodean Albatross [64458]	Vulnerable*	Species or species habitat may occur within area
Diomedea dabbenena Triston Albertaga (66474)		Canadan ay anasisa
Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
Diomedea exulans (sensu lato) Wandaring Albatross [1073]	Vulnerable	Species or esseics
Wandering Albatross [1073]	vuinerable	Species or species habitat may occur within area
<u>Diomedea gibsoni</u>		
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	M. L	0
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 occu within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour knowr to occur within area
<u>Dermochelys coriacea</u> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species
Learnerback Turne, Learnery Turne, Luth [1768]	Endangered	Species or species

Name	Threatened	Type of Presence
		habitat known to occur
		within area
<u>Dugong dugon</u>		
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]	Endongorod	Charles or angeles
	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
<u>Lepidochelys olivacea</u> Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species
	Endangered	Species or species habitat known to occur within area
Megaptera novaeangliae	\ /   -  -	Congressition
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		Species or ansairs
White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus		Charles as assairs
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis		Om a discussion in
Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or appeies
эрестасіей імопагсіі [610]		Species or species habitat likely to occur

Name	Threatened	Type of Presence
Myiagra cyanoleuca Satin Flycatcher [612]		within area  Species or species
Rhipidura rufifrons		habitat known to occur within area
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		Within Glod
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
Arenaria interpres Ruddy Turnstone [872]		within area  Roosting known to occur
Calidris acuminata Sharp-tailed Sandpiper [874]		within area  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
Calidris ruficollis Red-necked Stint [860]		within area  Roosting known to occur within area
Calidris tenuirostris Great Knot [862]		Roosting known to occur within area
<u>Charadrius bicinctus</u> Double-banded Plover [895]		Roosting known to occur within area
<u>Charadrius leschenaultii</u> Greater Sand Plover, Large Sand Plover [877]		Roosting known to occur within area
<u>Charadrius mongolus</u> Lesser Sand Plover, Mongolian Plover [879]		Roosting known to occur within area
<u>Charadrius veredus</u> 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
<u>Limicola falcinellus</u> Broad-billed Sandpiper [842]		Roosting known to occur within area
<u>Limosa lapponica</u> Bar-tailed Godwit [844]		Roosting known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area

Nama	Thurstoned	Type of Dressans
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 Ac

- Threatened Species list. Type of Presence
Type of Presence
Roosting known to occur within area
Species or species habitat may occur within area
Species or species habitat likely to occur within area
Breeding known to occur within area
Species or species habitat likely to occur within area
Roosting known to occur within area
Davida I a a tanan
Roosting known to occur within area
Davida I a a tanan
Roosting known to occur within area
Davida Lancata de Cara
Roosting known to occur within area
Decelled Land
Roosting known to occur

Name	Threatened	Type of Presence
		within area
<u>Calidris melanotos</u> Pectoral Sandpiper [858]		Roosting known to occur
Calidris ruficollis Red-necked Stint [860]		within area  Roosting known to occur
Calidris tenuirostris		within area
Great Knot [862]		Roosting known to occur within area
<u>Charadrius bicinctus</u> 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
<u>Charadrius mongolus</u> Lesser Sand Plover, Mongolian Plover [879]		Roosting known to occur
Charadrius ruficapillus		within area
Red-capped Plover [881]  Charadrius veredus		Roosting known to occur within area
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
<u>Diomedea dabbenena</u> Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
Diomedea exulans (sensu lato)		arca
Wandering Albatross [1073]	Vulnerable	Species or species habitat may occur within area
<u>Diomedea gibsoni</u>		
Gibson's Albatross [64466]	Vulnerable*	Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]  Gallinago megala		Roosting known to occur within area
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
<u>Hirundapus caudacutus</u> White-throated Needletail [682]		Species or species
Lathamus discolor		habitat known to occur within area
Swift Parrot [744]	Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
<u>Limicola falcinellus</u> Broad-billed Sandpiper [842]		Roosting known to occur
<u>Limnodromus semipalmatus</u> Asian Dowitcher [843]		within area  Roosting known to occur within area
<u>Limosa lapponica</u> Bar-tailed Godwit [844]		Roosting known to occur within area
<u>Limosa limosa</u> 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
Monarcha melanopsis Black-faced Monarch [609]		area Species or species habitat known to occur
Monarcha trivirgatus Spectacled Monarch [610]		within area  Species or species
Myiagra cyanoleuca		habitat likely to occur within area
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
Red-necked Avocet [871]  Rhipidura ruffrons		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

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
<u>Tringa stagnatilis</u> Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur
Fish		within area
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

habitat may occur within

area

Name **Threatened** Type of Presence Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Species or species Seahorse [66240] habitat may occur within area Lissocampus runa Javelin Pipefish [66251] Species or species habitat may occur within Maroubra perserrata Sawtooth Pipefish [66252] Species or species habitat may occur within Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253] Species or species habitat may occur within 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 Species or species habitat may occur within [66275] area Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, Species or species habitat may occur within [66183] Solenostomus paegnius Rough-snout Ghost Pipefish [68425] Species or species habitat may occur within area Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Species or species Ornate Ghost Pipefish [66184] habitat may occur within area Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Species or species Pipefish [66277] habitat may occur within area Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Species or species Alligator Pipefish [66279] habitat may occur within area <u>Trachyrhamphus bicoarctatus</u> Bentstick Pipefish, Bend Stick Pipefish, Short-Species or species tailed Pipefish [66280] 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** Species or species

Dugong [28]

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
<u>Lagenorhynchus obscurus</u> Dusky Dolphin [43]		Species or species habitat may occur within area

Name	Status	Type of Presence
Megaptera novaeangliae		
Humpback Whale [38]  Orcaella brevirostris	Vulnerable	Congregation or aggregation known to occur within area
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
<u>Tursiops aduncus</u>		
Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
<u>Tursiops truncatus s. str.</u>		
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		wittiiii area
House Sparrow [405]		Species or species
Tiodos opanon [100]		habitat likely to occur
		within area
Streptopelia chinensis		
Spotted Turtle-Dove [780]		Species or species
		habitat likely to occur
Sturnus vulgaris		within area
Common Starling [389]		Species or species
Common Starling [505]		habitat likely to occur
		within area
Frogs		
Bufo marinus		
Cane Toad [1772]		Species or species
		habitat likely to occur
Dhinelle menine		within area
Rhinella marina		Charles or anadias
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		0
Domestic Dog [82654]		Species or species
		habitat likely to occur within area
Felis catus		within area
Cat, House Cat, Domestic Cat [19]		Species or species
,,		habitat likely to occur
		within area
<u>Lepus capensis</u>		
Brown Hare [127]		Species or species
		habitat likely to occur within area
Mus musculus		within area
House Mouse [120]		Species or species
110000 1110000 [120]		habitat likely to occur
		within area
Oryctolagus cuniculus		
Rabbit, European Rabbit [128]		Species or species
		habitat likely to occur
Rattus norvegicus		within area
Brown Rat, Norway Rat [83]		Species or species
Brown reat, reorway reat [00]		habitat likely to occur
		within area
Rattus rattus		
Black Rat, Ship Rat [84]		Species or species
		habitat likely to occur
Sus scrofa		within area
		Species or appoins
Pig [6]		Species or species habitat likely to occur
		within area
<u>Vulpes vulpes</u>		
Red Fox, Fox [18]		Species or species
		habitat likely to occur
Disease		within area
Plants		
Alternanthera philoxeroides		Charles ar ar!
Alligator Weed [11620]		Species or species habitat likely to occur
		within area

Name	Status	Type of Presence
Anredera cordifolia		31
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, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171] Chrysanthemoides monilifera		Species or species habitat likely to occur within area
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] Hymenachne amplexicaulis		Species or species habitat likely to occur within area
Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754] Lantana camara		Species or species habitat likely to occur within area
Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] Parthenium hysterophorus		Species or species habitat likely to occur within area
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 Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]	S.x reichardtii	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
<del></del>		

#### 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.

© Commonwealth of Australia

Department of Sustainability, Environment, Water, Population and Communities

GPO Box 787

Canberra ACT 2601 Australia

+61 2 6274 1111

## **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 <u>Environment Assessments</u> and the EPBC Act including significance guidelines, forms and application process details.

Report created: 28/06/13 14:25:45

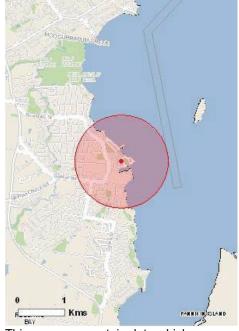
**Summary** 

**Details** 

Matters of NES
Other Matters Protected by the EPBC Act
Extra Information

Caveat

<u>Acknowledgements</u>



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 <u>Administrative Guidelines on Significance</u>.

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 <a href="heritage values">heritage values</a> 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 <u>permit</u> 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]  Dasyornis brachypterus	Endangered	Species or species habitat likely to occur within area
Eastern Bristlebird [533]	Endangered	Species or species
	Liluangereu	habitat may occur within area
<u>Diomedea exulans antipodensis</u>		
Antipodean Albatross [82269]	Vulnerable	Species or species habitat may occur within area
<u>Diomedea exulans exulans</u>		
Tristan Albatross [82337]  Diomedea exulans gibsoni	Endangered	Species or species habitat may occur within area
Gibson's Albatross [82271]	Vulnerable	Species or species
•	Vullerable	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		4.00
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat may occur within area
Mammals Chalinglahus dunyari		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]  Dasyurus hallucatus	Vulnerable	Species or species habitat may occur within area
Northern Quoll [331]	Endangered	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland popula Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	tion) 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]  Phascolarctes cinereus (combined populations of Old	Vulnerable	Congregation or aggregation known to occur within area
Phascolarctos cinereus (combined populations of Qld 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]  Pteropus poliocephalus	Vulnerable	Species or species habitat may occur within area
Grey-headed Flying-fox [186]  Xeromys myoides	Vulnerable	Foraging, feeding or related behaviour known to occur within area
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
<u>Taeniophyllum muelleri</u> 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
<u>Dermochelys coriacea</u> 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
Carcharodon carcharias		area
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
Rhincodon typus Whale Shark [66680]	Vulnerable	area Species or species habitat may occur within area
Listed Migratory Species  * Species is listed under a different scientific name on the second	the EPBC Act - Threatened	[ Resource Information ]   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	Made and Link	On a day was a d
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
<u>Diomedea gibsoni</u> 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		0
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
Migratory Marine Species		area
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] Chelonia mydas	Endangered	Breeding known to occur within area
Green Turtle [1765]	Vulnerable	Foraging, feeding or

Name	Threatened	Type of Presence
Dermochelys coriacea		related behaviour known to occur within area
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
<u>Dugong dugon</u>		
Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata	Mala analala	C
Hawksbill Turtle [1766]  Eubalaena australis	Vulnerable	Species or species habitat known to occur within area
Southern Right Whale [40]	Endangered	Species or species
	Lindangorod	habitat likely to occur within area
Lagenorhynchus obscurus  Dusky Dolphin [43]		Species or species
Lamna nasus		habitat may occur within area
Porbeagle, Mackerel Shark [83288]		Species or species
Lepidochelys olivacea		habitat may occur within area
Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species
Megaptera novaeangliae		habitat known to occur within area
Humpback Whale [38]	Vulnerable	Congregation or
		aggregation known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or
Orcaella brevirostris		related behaviour known to occur within area
Irrawaddy Dolphin [45]		Species or species
Orcinus orca		habitat likely to occur within area
Killer Whale, Orca [46]		Species or species
Rhincodon typus		habitat may occur within area
Whale Shark [66680]	Vulnerable	Species or species
Sousa chinensis		habitat may occur within area
Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
Migratory Terrestrial Species		within area
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
Merops ornatus		habitat known to occur within area
Rainbow Bee-eater [670]		Species or species
Monarcha melanopsis		habitat may occur within area
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		0
Satin Flycatcher [612]		Species or species habitat known to occur
		within area
Rhipidura rufifrons		Consiss or annaiss
Rufous Fantail [592]		Species or species habitat likely to occur
		within area
Xanthomyza phrygia Regent Honeyeater [430]	Endangered*	Foraging, feeding or
Negent Honeyeater [400]	Liluangered	related behaviour likely
Migratow Watlanda Chasias		to occur within area
Migratory Wetlands Species Actitis hypoleucos		
Common Sandpiper [59309]		Species or species
		habitat known to occur
Ardea alba		within area
Great Egret, White Egret [59541]		Breeding known to occur
Ardon ibin		within area
Ardea ibis Cattle Egret [59542]		Species or species
		habitat likely to occur
Arenaria interpres		within area
Ruddy Turnstone [872]		Species or species
		habitat known to occur
Calidris acuminata		within area
Sharp-tailed Sandpiper [874]		Species or species
		habitat known to occur within area
Calidris alba		within area
Sanderling [875]		Species or species
		habitat known to occur within area
<u>Calidris canutus</u>		Within Grod
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		0
Red-necked Stint [860]		Species or species habitat known to occur
		within area
Calidris tenuirostris Great Knot [862]		Species or species
Great Knot [662]		habitat known to occur
Chanadrina hisipatus		within area
Charadrius bicinctus Double-banded Plover [895]		Species or species
		habitat known to occur
Charadrius leschenaultii		within area
Greater Sand Plover, Large Sand Plover [877]		Species or species
·		habitat known to occur
Charadrius mongolus		within area
Lesser Sand Plover, Mongolian Plover [879]		Species or species
		habitat known to occur within area
Charadrius veredus		within alsa
Oriental Plover, Oriental Dotterel [882]		Species or species
		habitat known to occur within area

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]  Limicola falcinellus		Species or species habitat known to occur within area
Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
<u>Limosa lapponica</u>		
Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<u>Limosa limosa</u>		
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		On anian assessi
Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Xenus cinereus Tarak Sandainar (50200)		Species or appairs
Terek Sandpiper [59300]		Species or species habitat known to occur within area
Other Matters Protected by the EPBC Act		

#### Other Matters Protected by the EPBC Act

# Listed Marine Species \* 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]  Calidris canutus		Species or species habitat known to occur within area
Red Knot, Knot [855]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]		Species or species
Calidris melanotos		habitat known to occur within area
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
<u>Charadrius bicinctus</u> Double-banded Plover [895]		Species or species
Charadrius leschenaultii		habitat known to occur within area
Greater Sand Plover, Large Sand Plover [877]		Species or species habitat known to occur within area
<u>Charadrius mongolus</u> Lesser Sand Plover, Mongolian Plover [879]		Species or species habitat known to occur within area
Charadrius ruficapillus		within area
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
<u>Diomedea dabbenena</u> Tristan Albatross [66471]	Endangered*	Species or species

Name	Threatened	Type of Presence
		habitat may occur within
B: 1 ( 1 ( )		area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species
Wallacing Abau 035 [1070]	Valliciable	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
Heteroscelus brevipes		habitat known to occur within area
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		Charies ar anasias
White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor	Fadanasad	0
Swift Parrot [744]	Endangered	Species or species habitat may occur within area
Limicola falcinellus		0
Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
<u>Limnodromus semipalmatus</u> 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
<u>Limosa limosa</u> Black-tailed Godwit [845]		Species or species
· ·		habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species
	Endangered	habitat may occur within area
Macronectes halli Northern Ciant Petrol [1061]	Vulnerable	Species or appoins
Northern Giant-Petrel [1061]	vuinerable	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
Opeciacied inicitatori [010]		habitat likely to occur

Name	Threatened	Type of Dresence
Name	rnreatened	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		0
Pacific Golden Plover [25545]		Species or species habitat known to occur
		within area
Pluvialis squatarola		Charies ar anasias
Grey Plover [865]		Species or species habitat known to occur
		within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed		Species or appoins
Shearwater [1043]		Species or species habitat likely to occur
		within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species
Neu-neokeu Avocet [o7 1]		habitat known to occur
Dhiniduna mufifuana		within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species
randa ranan [602]		habitat likely to occur
Postratula hanghalangia (cangulata)		within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species
	<b>3</b>	habitat likely to occur
Sterna albifrons		within area
Little Tern [813]		Species or species
		habitat may occur within
Thalassarche impavida		area
Campbell Albatross [64459]	Vulnerable*	Species or species
		habitat may occur within
Thinornis rubricollis		area
Hooded Plover [59510]		Species or species
		habitat known to occur within area
Tringa glareola		witiiiii ai ea
Wood Sandpiper [829]		Species or species
		habitat known to occur within area
Tringa stagnatilis		within area
Marsh Sandpiper, Little Greenshank [833]		Species or species
		habitat known to occur within area
Xenus cinereus		within aroa
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
<u>Hippichthys heptagonus</u> 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
<u>Hippocampus kelloggi</u> Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area
<u>Hippocampus kuda</u> 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
<u>Lissocampus runa</u> Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]  Micrognathus andersonii		Species or species habitat may occur within area
Anderson's Pipefish, Shortnose Pipefish [66253]  Micrognathus brevirostris		Species or species habitat may occur within area
thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species

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
Solegnathus dunckeri		area
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
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		area 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]  Trachyrhamphus bicoarctatus		Species or species habitat may occur within area
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]  Chelonia mydas	Endangered	Breeding known to occur within area
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]  Hydrophis elegans	Vulnerable	Species or species habitat known to occur within area
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
<u>Delphinus delphis</u> 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] Stenella attenuata		Breeding known to occur within area
Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
<u>Tursiops aduncus</u> Indian Ocean Bottlenose Dolphin, Spotted		

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

Note that not all Indigenous sites may be listed.  Name Natural Southern and Eastern Moreton Bay 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, Fig., 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 rabitat likely to occur within area  Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803] Species or species habitat likely to occur within area  Columba livia Species or species habitat likely to occur within area  Columba livia Species or species habitat likely to occur within area  Sturnus Walgaris Common Starling [389] Species or species rabitat likely to occur within area  Sturnus wulgaris Common Starling [389] Species or species habitat likely to occur within area	Places on the RNE		[ Resource Information ]
Natural   Southern and Eastern Moreton Bay   QLD   Registered	Note that not all Indigenous sites may be listed.		
State and Territory Reserves  [Resource Information] Name  State Moreton Bay  QLD  Invasive Species  [Resource Information] Invasive Species  [Resource Information] Invasive Species  [Resource Information] 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  Columba livia  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  Common Starling [389]  Species or species habitat likely to occur within area  Common Starling [389]  Species or species habitat likely to occur within area	Name	State	Status
State and Territory Reserves    Resource Information	Natural		
Name Moreton Bay OLD  Invasive Species  Invasive Species  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 on species habitat likely to occur within area  Anas platyrhynchos  Mallard [974]  Species or species on species habitat likely to occur within area  Carduelis carduelis  European Goldfinch [403]  Rock Pigeon, Rock Dove, Domestic Pigeon [803]  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  Streptopelia chinensis  Spotted Turtle-Dove [780]  Species or species habitat likely to occur within area  Streptopelia chinensis  Common Starling [389]  Species or species habitat likely to occur within area	Southern and Eastern Moreton Bay	QLD	Registered
Moreton Bay QLD    Invasive Species   Resource Information	State and Territory Reserves		[Resource Information]
Invasive Species  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  Common Starling [389] Species or species habitat likely to occur within area			
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	Moreton Bay		QLD
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  Common Starling [389] Species or species habitat likely to occur within area	•		
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  Species or species habitat likely to occur within area  Species or species habitat likely to occur within area  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 rapecies habitat likely to occur within area	plants that are considered by the States and Territoric biodiversity. The following feral animals are reported: and Cane Toad. Maps from Landscape Health Project	es to pose a particularly sign Goat, Red Fox, Cat, Rabbi	nificant threat to t, Pig, Water Buffalo
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 rapeies habitat likely to occur within area	Name	Status	Type of Presence
Common Myna, Indian Myna [387]  Anas platyrhynchos  Mallard [974]  Mallard [974]  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			
Anas platyrhynchos  Mallard [974]  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]  Rock Pigeon, Rock Dove, Domestic Pigeon [803]  Nutmeg Mannikin [399]  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			
Mallard [974]  Mallard [974]  Mallard [974]  Mallard [974]  Mallard [974]  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			habitat likely to occur
Carduelis carduelis  European Goldfinch [403]  European Goldfinch [403]  Species or species habitat likely to occur within area  Columba livia  Rock Pigeon, Rock Dove, Domestic Pigeon [803]  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			
European Goldfinch [403]  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			habitat likely to occur
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			Consider an america
Rock Pigeon, Rock Dove, Domestic Pigeon [803]  Lonchura punctulata  Nutmeg Mannikin [399]  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  Strunus vulgaris  Common Starling [389]  Species or species habitat likely to occur within area			habitat likely to occur
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			
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			habitat likely to occur
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			Consiss or onesis
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			habitat likely to occur
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			Species or species
Species or species habitat likely to occur within area  Sturnus vulgaris  Common Starling [389]  Species or species habitat likely to occur within area	,		habitat likely to occur
habitat likely to occur within area  Sturnus vulgaris  Common Starling [389]  Species or species habitat likely to occur within area			Species or species
Common Starling [389] Species or species habitat likely to occur within area			habitat likely to occur
habitat likely to occur within area			Charles on an exist
	Common Starling [389]		habitat likely to occur
	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		Within area
Bos taurus		
Domestic Cattle [16]  Canis lupus familiaris		Species or species habitat likely to occur within area
Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus		
Cat, House Cat, Domestic Cat [19] <u>Lepus capensis</u>		Species or species habitat likely to occur within area
Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus		
House Mouse [120]  Oryctolagus cuniculus		Species or species habitat likely to occur within area
Rabbit, European Rabbit [128]		Species or species
Rattus norvegicus		habitat likely to occur within area
Brown Rat, Norway Rat [83]		Species or species
Rattus rattus		habitat likely to occur within area
Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa		
Pig [6]  Vulpes vulpes		Species or species habitat likely to occur within area
Red Fox, Fox [18]		Species or species habitat likely to occur
Plants		within area
Alternanthera philoxeroides		
Alligator Weed [11620]		Species or species habitat likely to occur within area
<u>Asparagus aethiopicus</u> Asparagus Fern, Ground Asparagus, Basket Fern,		Species or species
Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425] Cabomba caroliniana		Species or species habitat likely to occur within area
Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171] Chrysanthemoides monilifera		Species or species habitat likely to occur within area
Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. rotundata		
Bitou Bush [16332]  Cryptostegia grandiflora		Species or species habitat likely to occur within area
Rubber Vine, Rubbervine, India Rubber Vine, India		Species or species
Rubbervine, Palay Rubbervine, Purple Allamanda		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, Wat West Indian Grass, West Indian Marsh [31754] Lantana camara		Species or species habitat likely to occur within area
Lantana, Common Lantana, Kamara La Large-leaf Lantana, Pink Flowered Lant Flowered Lantana, Red-Flowered Sage Sage, Wild Sage [10892] Parthenium hysterophorus	tana, Red	Species or species habitat likely to occur within area
Parthenium Weed, Bitter Weed, Carrot Ragweed [19566]  Salix spp. except S.babylonica, S.x cald		Species or species habitat likely to occur within area
Willows except Weeping Willow, Pussy Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Wate Kariba Weed [13665] Senecio madagascariensis	ermoss,	Species or species habitat likely to occur within area
Fireweed, Madagascar Ragwort, Madag Groundsel [2624]	gascar	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.

© Commonwealth of Australia

Department of Sustainability, Environment, Water, Population and Communities

GPO Box 787

Canberra ACT 2601 Australia

+61 2 6274 1111

## **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).

<u>Likelihood of occurrence categories</u>: Known – from other surveys (BAAM, other consultancies, databases), species recorded onsite; <u>Likely to occur</u> – 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	Status		tus Database source					Likelihood of Occurrence
Faililly	EPBC NCA RCC	RCC	PM	WN	QM	NEDS	Likelinood of Occurrence				
BIRDS											
ARDEIDAE	Ardea modesta	Great Egret	М	S	Sig	х	6			Likely to occur on tidal mudflats and ponded areas	
ACCIPITRIDAE	Haliaeetus leucogaster	White-bellied Sea- Eagle	М	S	Sig	х	10			Likely to occur, foraging only	
SCOLOPACIDAE	Xenus cinereus	Terek Sandpiper	М	S	Sig	х	9			Likely to occur on tidal mudflats	
SCOLOPACIDAE	Calidris acuminata	Sharp-tailed Sandpiper	М	S	Sig	х	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	М	S	Sig		17			Likely to occur foraging over waters and on mudflats	

Family	Species	Common name	Status			Data	abase	sourc	e	Likelihood of Occurrence
Faililly	Species	Common name	EPBC	NCA	RCC	PM	WN	QM	NEDS	Likelii100d of Occurrence
LARIDAE	Thallaseus bergii	Crested Tern	М	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	М	S	Sig	х	8			Likely to occur on tidal mudflats, mangroves, saltmarsh, open, grassed and ponded areas
CHARADRIIDAE	Pluvialis squatarola	Grey Plover	М	S	Sig	х	1			Likely to occur on tidal mudflats and saltmarsh
CHARADRIIDAE	Charadrius bicincutus	Double-banded Plover	М	S	Sig	x	9			Likely to occur on tidal mudflats, saltmarsh and open, grassed areas
CHARADRIIDAE	Charadrius mongolus	Lesser Sand Plover	М	S	Sig	x	16			Likely to occur on tidal mudflats, mangroves, saltmarsh
CHARADRIIDAE	Charadrius Ieschenaultii	Greater Sand Plover	М	S	Sig	х	8			Likely to occur on tidal mudflats, mangroves, saltmarsh
SCOLOPACIDAE	Gallinago hardwickii	Latham's Snipe	М	S	Sig	х	1			Potential to occur in saltmarsh, mangroves and wetter, vegetated areas
SCOLOPACIDAE	Limosa lapponica	Bar-tailed Godwit	М	S	Sig	х	25			Likely to occur on tidal mudflats and ponded areas
SCOLOPACIDAE	Numenius minutus	Little Curlew	М	S	Sig	х	1			Likely to occur on tidal mudflats and open, grassy areas
SCOLOPACIDAE	Numenius phaeopus	Whimbrel	М	S	Sig	х	19			Likely to occur on tidal mudflats, mangroves and open, grassy areas
SCOLOPACIDAE	Numenius	Eastern Curlew	М	NT	Sig	Х	20		Υ	Likely to occur on tidal

Family	Species	Common name	Status			Data	abase	sourc	е	Likelihood of Occurrence
ramily	Species	Common name	EPBC	NCA	RCC	PM	WN	QM	NEDS	Likelinood of Occurrence
	madagascariensis									mudflats, mangroves and
										saltmarsh
SCOLOPACIDAE	Tringa stagnatilis	Marsh Sandpiper	М	S	Sig	X	1			Likely to occur on tidal
		march canapipo.			0.9					mudflats and mangroves
0001 00401045	A - 4:4: - I I	O O doi			0:					Likely to occur on tidal
SCOLOPACIDAE	Actitis hypoleucos	Common Sandpiper	М	S	Sig	Х	1			mudflats, mangroves and
			1							saltmarsh Likely to occur on tidal
SCOLOPACIDAE	Tringa brevipes	Grey-tailed Tattler	M	S	Sig	Х	21			mudflats and mangroves
										Likely to occur on tidal
SCOLOPACIDAE	Arenaria interpres	Ruddy Turnstone	M	S	Sig	Х	15			mudflats
0001 00401045	0 11 1 1 1 1	0 11/			0:		40			Likely to occur on tidal
SCOLOPACIDAE	Calidris tenuirostris	Great Knot	M	S	Sig	Х	10			mudflats
SCOLOPACIDAE	Calidris canutus	Red Knot	М	S	Sig	х	6			Likely to occur on tidal
300LOF ACIDAL	Canaris Cariatas	Red Kilot	IVI	3	Sig	^	0			mudflats
SCOLOPACIDAE	Calidris alba	Sanderling	М	S	Sig	x	2			Likely to occur on tidal
OCCECT ACIDALE	Canario and	Candoning			Olg	^	_			mudflats
SCOLOPACIDAE	Calidris ruficollis	Red-necked Stint	М	S	Sig	X	13			Likely to occur on tidal
										mudflats
SCOLOPACIDAE	Calidris ferruginea	Curlew Sandpiper	M	S	Sig	Х	14			Likely to occur on tidal mudflats
										Likely to occur foraging over
LARIDAE	Sternula albifrons	Little Tern	M	E	Sig	Х	12			waters and on mudflats
APODIDAE	Apus pacificus	Fork-tailed Swift	М	S		Х	2			Likely to occur (flyover only)
	· · ·		1							Potential to occur, foraging
MEROPIDAE	Merops omatus	Rainbow Bee-eater	M	S		Х	5			only
	Symposiarchus									Potential to occur as a visitor
MONARCHIDAE	trivirgatus	Spectacled Monarch	M	S		Χ	1			to dense vegetation and
	urvirgatus						mangroves			
MONARCHIDAE	Myiagra cyanoleuca	Satin Flycatcher	М	S		x	1			Potential to occur as a visitor
	, ragra o jarroroada						Ľ.			to mangroves
ARDEIDAE	Egretta sacra	Eastern Reef Egret	М	S			3			Potential to occur in
		-				-	-	-		mangroves
ACCIPITRIDAE	Pandion cristatus	Eastern Osprey	M	S	Sig		7			Likely to occur, foraging and
			1		_					nesting, particularly on man-

Eamily.	Species	Common nome	Status			Data	abase	sourc	е	Likelihood of Occurrence
Family	Species	Common name	EPBC	NCA	RCC	PM	WN	QM	NEDS	Likelinood of Occurrence
										made structures
ACCIPITRIDAE	Lophoictinia isura	Square-tailed Kite		NT	Sig		1		Υ	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	М	S	Sig		8			Likely to occur on tidal mudflats and saltmash
LARIDAE	Thalasseus bengalensis	Lesser Crested Tern	М	S			2			Unlikely to occur, preferred habitat not present
LARIDAE	Chlidonias leucopterus	White-winged Black Tern	М	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		х				Unlikely to occur, pelagic species
PROCELLARIIDAE	Macronectes giganteus	Southern Giant-Petrel	E,M	Е		х				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		х				Unlikely to occur, pelagic species
PROCELLARIIDAE	Ardenna cameipes	Flesh-footed Shearwater	М	S		х				Unlikely to occur, pelagic species
ARDEIDAE	Botaurus poiciloptilus	Australasian Bittern		LC		х				Potential to occur in drain tussocks and occasionally saltmarsh
ARDEIDAE	Ardea ibis	Cattle Egret	М	S		х				Potential to occur in paddocks and tidal mudflats

Family	Omasias	0	Status			Data	abase	sourc	е	Likelihood of Occurrence
ramily	Species	Common name	EPBC	NCA	RCC	PM	WN	QM	NEDS	Likelinood of Occurrence
ACCIPITRIDAE	Erythrotriorchis radiatus	Red Goshawk	V	Е		х				Potential to occur, as a rare
										visitor, foraging only
TURNICIDAE	Turnix melanogaster	Black-breasted Button-quail	V	V		Х				Unlikely to occur, habitat not present in PDA
CHARADRIIDAE	Charadrius veredus	Oriental Plover	М	S		х				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	М	S		х				Likely to occur on tidal mudflats
SCOLOPACIDAE	Tringa glareola	Wood Sandpiper	М	S		х				Likely to occur in mangroves, saltmarsh and tidal mudflats
SCOLOPACIDAE	Limicola falcinellus	Broad-billed Sandpiper	М	S		х				Likely to occur on tidal mudflats
PSITTACIDAE	Lathamus discolor	Swift Parrot	Е	Е		х				Potential to occur, foraging only
PSITTACIDAE	Cyclopsitta diophthalma coxeni	Double-eyed Fig- Parrot (Coxen's)	E,M	Е		х				Unlikely to occur due to rarity
APODIDAE	Hirundapus caudacutus	White-throated Needletail	М	S		х				Potential to occur as flyover only
DASYORNITHIDAE	Dasyornis brachypterus	Eastern Bristlebird	Е	Е		х				Unlikely to occur as habitat not present
MELIPHAGIDAE	Anthochaera phrygia	Regent Honeyeater	E,M	Е		х				Potential to occur as a rare visitor, foraging only
RHIPIDURIDAE	Rhipidura rufifrons	Rufous Fantail	М	S		х				Potential to occur in vegetated areas
MONARCHIDAE	Monarcha melanopsis	Black-faced Monarch	М	S		х				Potential to occur as a rare visitor, foraging only
DIOMEDIDAE	Diomedea antipodensis antipodensis	Antipodean Albatross	V,M	V		х				Unlikely to occur, pelagic species
DIOMEDIDAE	Diomedea antipodensis gibsoni	Gibson's Albatross	V,M	V		х				Unlikely to occur, pelagic species
ESTRILDIDAE	Poephila cincta cincta	Black-throated Finch (Southern subsp)	E	Е	Sig	х				Unlikely to occur as habitat not present

Familia	Omenica	0	Status			Data	abase	sourc	e	
Family	Species	Common name	EPBC	NCA	RCC	PM	WN	QM	NEDS	Likelihood of Occurrence
MAMMALS										
PHASCOLARCTIDAE	Phascolarctos cinereus (SEQ Bioregion)	Koala (SEQ Bioregion)	V	V	Sig	х	365			Known to occur in koala habitat trees across PDA
PTEROPODIDAE	Pteropus poliocephalus	Grey-headed Flying- fox	V	LC	Sig	х				Known to occur, foraging only
DASYURIDAE	Dasyurus hallucatus	Northern Quoll	Е	LC		х				Unlikely to occur, habitat not present
DASYURIDAE	Dasyurus maculatus maculatus	Spotted-tailed Quoll (SE Mainland)	Е	V		х				Unlikely to occur, habitat not present
POTOROIDAE	Potorous tridactylus tridactylus	Long-nosed Potoroo (SE Mainland)	V	V		х				Unlikely to occur due to rarity
VESPERTILIONIDAE	Chalinolobus dwyeri	Large Pied Bat	V	V	Sig	х				Unlikely to occur as habitat not present
MURIDAE	Xeromys myoides	False Water-rat	V	V		х				Unlikely to occur due to rarity and aversion to human settlements
DUGONGIDAE	Dugong dugon	Dugong	М	V	Sig	х				Potential to occasionally occur given known occurrence in Moreton Bay
DELPHINIDAE	Orcinus orca	Killer Whale	М	LC		х				Unlikely to occur, habitat not present
DELPHINIDAE	Sousa chinensis	Indo-Pacific Hump- backed Dolphin	М	NT		х				Potential to occur as occasional visitor
BALAENOPTERIDAE	Balaenoptera edeni	Bryde's Whale	М	LC		х				Unlikely to occur, habitat not present
BALAENOPTERIDAE	Megaptera novaeangliae	Humpback Whale	V,M	V		х				Unlikely to occur, habitat not present
REPTILES										
CHELONIIDAE	Caretta caretta	Loggerhead Turtle	E,M	Е	Sig	х				Unlikely to occur, except as rare visitor
CHELONIIDAE	Chelonia mydas	Green Turtle	V,M	V	Sig	х		х		Unlikely to occur, except as rare visitor
CHELONIIDAE	Eretmochelys imbricata	Hawksbill Turtle	V,M	V	Sig	х				Potential to occur in mangrove fringes, however

Family	Species	Common name	Status			Data	base	sourc	е	Likelihood of Occurrence
Faililly	Species	Common name	EPBC	NCA	RCC	PM	WN	QM	NEDS	Likelinood of Occurrence
										expected to rarely visit in PDA
CHELONIIDAE	Lepidochelys olivacea	Pacific Ridley	E,M	Е	Sig	х				Unlikely to occur, except as rare visitor
CHELONIIDAE	Natator depressus	Flatback Turtle	V,M	V	Sig	х				Unlikely to occur, except as rare visitor
DERMOCHELYIDAE	Dermochelys coriacea	Leathery Turtle	E,M	Е	Sig	х				Unlikely to occur, except as rare visitor
PYGOPODIDAE	Delma torquata	Adorned Delma	V	V		х				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		Data	base	sourc	е	
raillily	Species	Common name	EPBC	NCA	RCC	PM	WN	HR	NEDS	Likelihood of occurrence
POACEAE	Arthraxon hispidus	Hairy Joint Grass	V	V		Х				Unlikely to occur as habitat not present.
LAURACEAE	Cryptocarya foetida	Stinking Laurel	V	V		Х				Unlikely to occur as habitat not present.
ORCHIDACEAE	Cryptostylis hunteriana	Leafless Tongue Orchid	V	LC		Х				Unlikely to occur as habitat not present.
ORCHIDACEAE	Phaius australis	Lesser Swamp Orchid	Е	Е		Х				Unlikely to occur as habitat not present.
MORACEAE	Streblus pendulinus	Isaac Wood	Е	LC		Х				Unlikely to occur as habitat not present.
ORCHIDACEAE	Taeniophyllum muelleri	Minute Orchid	V	LC		Х				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).

<u>Likelihood of occurrence categories</u>: Known - from other surveys (BAAM, other consultancies, databases), species recorded onsite; <u>Likely to occur</u> – 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.

Eamily.	Chaoine	Common name		Status		Data	base	sourc	е	
Family	Species	Common name	EPBC	NCA	RCC	PM	WN	QM	NEDS	Likelihood of occurrence
AMPHIBIANS										
MYOBATRACHIDAE	Mixophyes iteratus	Giant Barred Frog	Е	Е		Х				Unlikely as preferred habitat not present
BIRDS			•							
ARDEIDAE	Ardea modesta	Great Egret	М	S	Sig	Х	1			Likely to occur on tidal mudflats and ponded areas
ACCIPITRIDAE	Haliaeetus leucogaster	White-bellied Sea-Eagle	М	S	Sig	Х	1			Likely to occur, foraging only
SCOLOPACIDAE	Xenus cinereus	Terek Sandpiper	М	S	Sig	Х	1			Potential to occur as a rare visitor to tidal mudflats
SCOLOPACIDAE	Calidris acuminata	Sharp-tailed Sandpiper	М	S	Sig	Х	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

				Status		Data	abase	sourc	е	
Family	Species	Common name	EPBC	NCA	RCC	PM	WN	QM	NEDS	Likelihood of occurrence
LARIDAE	Hydroprogne caspia	Caspian Tern	М	S	Sig		2			Known to occur, foraging over coastal waters and resting on mudflats
LARIDAE	Thalasseus bergii	Crested Tern	М	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	М	S	Sig	Х				Potential to occur as a rare visitor to tidal mudflats
CHARADRIIDAE	Pluvialis squatarola	Grey Plover	М	S	Sig	X				Potential to occur as a rare visitor to tidal mudflats
CHARADRIIDAE	Charadrius bicincutus	Double-banded Plover	М	S	Sig	Х				Potential to occur as a rare visitor to tidal mudflats
CHARADRIIDAE	Charadrius mongolus	Lesser Sand Plover	М	S	Sig	Х				Potential to occur as a rare visitor to tidal mudflats
CHARADRIIDAE	Charadrius Ieschenaultii	Greater Sand Plover	М	S	Sig	Х				Potential to occur as a rare visitor to tidal mudflats
SCOLOPACIDAE	Gallinago hardwickii	Latham's Snipe	М	S		X				Potential to occur as a rare visitor to wetland habitat in Weinam Creek
SCOLOPACIDAE	Limosa lapponica	Bar-tailed Godwit	М	S	Sig	Х				Potential to occur as a rare visitor to tidal mudflats
SCOLOPACIDAE	Numenius minutus	Little Curlew	M	S	Sig	Χ				Unlikely to occur
SCOLOPACIDAE	Numenius phaeopus	Whimbrel	М	S	Sig	X				Likely to occur as an occasional visitor to tidal mudflats
SCOLOPACIDAE	Numenius madagascariensis	Eastern Curlew	М	NT	Sig	Х			Υ	Likely to occur on tidal mudflats, mangroves and saltmarsh
SCOLOPACIDAE	Tringa stagnatilis	Marsh Sandpiper	М	S	Sig	Х				Unlikely to occur
SCOLOPACIDAE	Actitis hypoleucos	Common Sandpiper	М	S	Sig	Х				Potential to occur as a rare visitor to tidal mudflats
SCOLOPACIDAE	Tringa brevipes	Grey-tailed Tattler	М	S	Sig	Х				Likely to occur as an occasional visitor to tidal mudflats

Family	Omenica	pecies Common name Status Database source				е				
Family	Species	Common name	EPBC	NCA	RCC	PM	WN	QM	NEDS	Likelihood of occurrence
SCOLOPACIDAE	Arenaria interpres	Ruddy	М	S	Sig	Х				Potential to occur as a rare visitor to
00020171012712	Thorrand merpree	Turnstone			O.g	, ·				tidal mudflats
SCOLOPACIDAE	Calidris tenuirostris	Great Knot	M	S	Sig	Χ				Potential to occur as a rare visitor to tidal mudflats
										Potential to occur as a rare visitor to
SCOLOPACIDAE	Calidris canutus	Red Knot	M	S	Sig	X				tidal mudflats
SCOLOPACIDAE	Calidris alba	Sanderling	М	S	Sig	Χ				Unlikely to occur; no suitable habitat
SCOLOPACIDAE	Calidris ruficollis	Red-necked	М	S	Sig	Х				Likely to occur as an occasional
00020171012712		Stint			O.g					visitor to tidal mudflats
SCOLOPACIDAE	Calidris ferruginea	Curlew Sandpiper	M	S	Sig	Χ				Potential to occur as a rare visitor to tidal mudflats
				1						Likely to occur foraging over coastal
LARIDAE	Sternula albifrons	Little Tern	M	E	Sig	X				waters
APODIDAE	Anua pagifigua	Fork-tailed Swift	М	S		Х				Potential to occur as a rare visitor
APODIDAE	Apus pacificus		IVI	3		^				(flyover only)
MEROPIDAE	Merops omatus	Rainbow Bee- eater	М	S		Х				Likely to occur, foraging only
MONARCHIDAE	Symposiarchus	Spectacled	М	S		Х				Potential to occur as a visitor to
MONANCHIDAL	trivirgatus	Monarch	IVI	5		^				dense vegetation and mangroves
MONARCHIDAE	Myiagra cyanoleuca	Satin Flycatcher	М	S		Х				Potential to occur as a visitor to
	, , ,	,		-						mangroves  Likely to occur as an occasional
ARDEIDAE	Egretta sacra	Eastern Reef	М	S						visitor to tidal mudflats and
/ INDEID/ IE	Lgroud odord	Egret	'*'							mangroves
										Likely to occur, foraging over coastal
ACCIPITRIDAE	Pandion cristatus	Eastern Osprey	M	S	Sig					waters; no known nest site present
										within or adjoining PDA
ACCIPITRIDAE	Lophoictinia isura	Square-tailed Kite		NT	Sig				Υ	Unlikely to occur; habitat largely unsuitable
		Bush Stone-								
BURHINIDAE	Burhinus grallarius	curlew		LC	Sig					Likely to occur across PDA
BURHINIDAE	Facetta magazina atria	Beach Stone-		\/	Cia					Unlikely to occur; habitat mostly
DUKTINIDAE	Esacus magnirostris	curlew		V	Sig					unsuitable
HAEMATOPODIDAE	Haematopus	Sooty		NT	Sig					Unlikely to occur; habitat mostly
	fuliginosus	Oystercatcher			0.9					unsuitable

				Status		Data	abase	sourc	е	S Likelihood of occurrence
Family	Species	Common name	EPBC	NCA	RCC	PM	WN	QM	NEDS	Likelihood of occurrence
SCOLOPACIDAE	Tringa nebularia	Common Greenshank	М	S	Sig					Unlikely to occur; habitat mostly unsuitable
LARIDAE	Thalasseus bengalensis	Lesser Crested Tern	М	S						Potential to occur as a rare visitor foraging over coastal waters
LARIDAE	Chlidonias leucopterus	White-winged Black Tern	М	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		Х				Unlikely to occur, pelagic species
DIOMEDIDAE	Diomedea antipodensis antipodensis	Antipodean Albatross	V,M	V		Х				Unlikely to occur, pelagic species
DIOMEDIDAE	Diomedea antipodensis gibsoni	Gibson's Albatross	V,M	V		Х				Unlikely to occur, pelagic species
PROCELLARIIDAE	Macronectes giganteus	Southern Giant- Petrel	E,M	Е		Х				Unlikely to occur, pelagic species
PROCELLARIIDAE	Macronectes halli	Northern Giant- Petrel	V,M	V		Х				Unlikely to occur, pelagic species
PROCELLARIIDAE	Pterodroma neglecta	Kermadec Petrel (Western)	V	LC		X				Unlikely to occur, pelagic species
PROCELLARIIDAE	Ardenna cameipes	Flesh-footed Shearwater	М	S		Х				Unlikely to occur, pelagic species
ARDEIDAE	Botaurus poiciloptilus	Australasian Bittern		LC		Х				Potential to occur in drain tussocks and occasionally saltmarsh
ARDEIDAE	Ardea ibis	Cattle Egret	М	S		Х				Potential to occur in open, grassy paddocks
ACCIPITRIDAE	Erythrotriorchis radiatus	Red Goshawk	V	Е		Χ				Unlikely to occur, no suitable habitat

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

				Status		Data	abase	sourc	е	
Family	Species	Common name	EPBC	NCA	RCC	PM	WN	QM	NEDS	Likelihood of occurrence
PTEROPODIDAE	Pteropus poliocephalus	Grey-headed Flying-fox	V	LC	Sig	Х	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	Е	LC		Х				Unlikely to occur, habitat not present
DASYURIDAE	Dasyurus maculatus maculatus	Spotted-tailed Quoll (SE Mainland)	Е	V		Х				Unlikely to occur, habitat not present
POTOROIDAE	Potorous tridactylus tridactylus	Long-nosed Potoroo (SE Mainland)	V	V		Х				Unlikely to occur due to rarity
VESPERTILIONIDAE	Chalinolobus dwyeri	Large Pied Bat	V	V	Sig	Х				Unlikely to occur as habitat not present
MURIDAE	Xeromys myoides	False Water-rat	V	V		Х			Υ	Unlikely to occur due to rarity and aversion of human settlements
DUGONGIDAE	Dugong dugon	Dugong	М	V	Sig	Х				Potential to occasionally occur given known occurrence in Moreton Bay
DELPHINIDAE	Orcinus orca	Killer Whale	M	LC		Χ				Unlikely to occur, habitat not present
DELPHINIDAE	Sousa chinensis	Indo-Pacific Hump-backed Dolphin	М	NT		x				Potential to occur as occasional visitor
BALAENOPTERIDAE	Balaenoptera edeni	Bryde's Whale	М	LC		Х				Unlikely to occur, habitat not present
BALAENOPTERIDAE	Megaptera novaeangliae	Humpback Whale	V,M	V		Х				Unlikely to occur, habitat not present
REPTILES										
CHELONIIDAE	Caretta caretta	Loggerhead Turtle	E,M	Е	Sig	Х				Unlikely to occur, except as rare visitor
CHELONIIDAE	Chelonia mydas	Green Turtle	V,M	V	Sig	Х				Unlikely to occur, except as rare visitor
CHELONIIDAE	Eretmochelys imbricata	Hawksbill Turtle	V,M	V	Sig	х				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

Eamily.	Species	Common name	,	Status		Data	abase	sourc	е	
Family	Species	Common name	EPBC	NCA	RCC	PM	WN	QM	NEDS	Likelihood of occurrence
	olivacea									visitor
CHELONIIDAE	Natator depressus	Flatback Turtle	V,M	V	Sig	Х				Unlikely to occur, except as rare visitor
DERMOCHELYIDAE	Dermochelys coriacea	Leathery Turtle	E,M	Е	Sig	Х				Unlikely to occur, except as rare visitor
PYGOPODIDAE	Delma torquata	Adorned Delma	V	V		Х				Unlikely to occur as habitat not present
INSECTS										
LYCAENIDAE	Acrodipsas illidgei	Illidge's ant-blue	V	LC			34	Х		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
			EPBC	NCA	RCC	PM	WN	HR	NEDS	occurrence
POACEAE	Arthraxon hispidus	Hairy Joint Grass	V	V		Х				Unlikely to occur as habitat not present.
EUPHORBIACEAE	Baloghia marmorata	Marbled Balogia	V	V		Х				Unlikely to occur as habitat not present.
LAURACEAE	Cryptocarya foetida	Stinking Laurel	V	V		Х				Unlikely to occur as habitat not present.
ORCHIDACEAE	Cryptostylis hunteriana	Leafless Tongue Orchid	V	LC		Х				Unlikely to occur as habitat not present.
ORCHIDACEAE	Phaius australis	Lesser Swamp Orchid	E	E		×			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		Х				Unlikely to occur as habitat not present.
ORCHIDACEAE	Taeniophyllum muelleri	Minute Orchid	V	LC		Х				Unlikely to occur as habitat not present.