NORTHEAST BUSINESS PARK

Report on
Matters of National Environmental Significance

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NORTHEAST BUSINESS PARK

REPORT ON

MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

EXECUTIVE SUMMARY

This report has been prepared in accordance with the Terms of Reference for an Environmental Impact Statement for the NEBP development, produced by the Coordinator General, Queensland Government, December 2006.

The NEBP development (or action) was referred to the Department of Environment and Heritage (DEH) on the 29th of June 2006 for the Minister to determine whether Commonwealth approval is required for the action. A Decision notice was issued on the 12 July 2006 notifying that the proposal is a controlled action (i.e. requires Commonwealth approval) pursuant to Part 3, Division 1, of the *EPBC Act*. The controlling provisions were determined to be:

- Sections 16 and 17B (Wetlands of international importance);
- Sections 18 and 18A (Listed threatened species and communities); and
- Sections 20 and 20A (Listed migratory species)

More specifically the NEBP development has the potential to affect the following Matters of National Environmental Significance ("Matters of NES"):

- the Ramsar listed wetlands of Moreton Bay;
- known and potential habitat for a diversity of listed threatened wildlife species; and
- known and potential habitat for a diversity of migratory species listed under international agreements, including:
    - appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) for which Australia is a Range State under the Convention;
    - the Agreement between the Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment (CAMBA); and
    - the Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA).

Potential impacts on the above listed Matters of NES that may result from the NEBP development include:

- major landform adjustment including the excavation of the marina basin and a balanced cut/fill operation within the site's Caboolture River flood plain to achieve the required flood immunity outcomes;
- direct physical impacts associated on most of the site's terrestrial ecosystems and associated species of native flora and fauna as a consequence of the clearance of native vegetation communities and associated development works; and
- impacts upon the Caboolture River and Moreton Bay associated with the dredging of the navigation channel and alterations to the patterns of usage of the Caboolture River that will result from the establishment of a marina at the NEBP site.

The likelihood that the proposed NEBP development would have a *significant impact* upon Matters of NES was assessed against the relevant criteria contained within the *EPBC Act Policy Statement 1.1 – Significant Impact Guidelines*. The results of this assessment generally indicate that the proposed NEBP development will not have a *significant impact* on Matters of NES that occur within and adjacent to the site, given that a number of impact mitigation and management measures are proposed as part of the NEBP development, including:

- development of the NEBP Area Plan, which is the statutory basis that will guide the and control development of the NEBP over the lifespan of the project;
- the provision of environmental off-sets to compensate for the clearance of some areas of existing vegetation and fauna habitat that will occur as a result of the NEBP development;
- the establishment and on-going maintenance of substantial revegetation and habitat and enhancement works within the NEBP Open Space precincts; and
- the NEBP development will be managed in accordance with a number of management plans, including:
    - a Storm Water Management Plan designed to reduce high levels of nutrients already present and known to be affecting the ecology of Caboolture River;
    - a Construction Environmental Management Plan (CEMP) which provides mechanisms in which environmental performance of the NEBP construction works can be measured and if required, provides procedures for identifying and implementing corrective actions;
    - an Acid Sulfate Soils Management Plan that has been designed to ensure that no significant adverse impacts on the receiving environment occur as a result of the disturbance of actual or potential acid sulfate soils;
    - a Dredging Site Based Management Plan, which outlines the potential impacts of Caboolture Rive navigation channel dredging activities and specifies mechanisms that will be incorporated to ensure environmental impacts associated with the dredging and spoil disposal are minimised as far as practicable; and
    - a Site Based Management Plan (SBMP) for various environmentally relevant activities (ERAs), associated with the NEBP marina and marine industry precincts, and provides an overarching framework for best practice environmental management for other ERAs that may be undertaken within the NEBP's marine industries precinct.

1. INTRODUCTION

This report on the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* ("*EPBC Act*") matters of national environmental significance has been prepared by Cardno on behalf on Northeast Business Park Pty Ltd in respect to the proposed development of the following seven parcels of land:

- Lot 10 on RP902079 (34 Nolan Drive, Burpengary);
- Lot 12 on RP145197 (60 Traflagar Drive, Morayfield);
- Lot 15 on RP902073 (15 Nolan Drive, Morayfield);
- Lot 2 on RP902075 (2 Nolan Drive, Burpengary);
- Lot 24 on SP158298 (195 Farry Road, Beechmere);
- Lot 7 on RP845326 (185 Farry Road, Burpengary); and
- Lot 17 on RP902072 (31 Trafalgar Drive, Morayfield).

Collectively these parcels of land cover an area of approximately 769 ha and will be referred to hereafter as "the site", unless specified otherwise. A locality plan of the site is provided as Figure 1.

Northeast Business Park Pty Ltd proposed the development of the site for a multi-use marina and business park concept that will integrate industry, marina facilities, commercial, residential, heritage and recreational greenspace precincts (the NEBP development).

This report has been prepared in accordance with the Terms of Reference for an Environmental Impact Statement for the NEBP development, produced by the Coordinator General, Queensland Government, December 2006.

The NEBP development (or action) was referred to the Department of Environment and Heritage (DEH) on the 29th of June 2006 for the Minister to determine whether Commonwealth approval is required for the action. A Decision notice was issued on the 12 July 2006 notifying that the proposal is a controlled action (i.e. requires Commonwealth approval) pursuant to Part 3, Division 1, of the *EPBC Act*. The controlling provisions were determined to be:

- Sections 16 and 17B (Wetlands of international importance);
- Sections 18 and 18A (Listed threatened species and communities); and
- Sections 20 and 20A (Listed migratory species).

This report has been prepared by Cardno (Qld) Pty Ltd in collaboration with The Ecology Lab Pty Ltd, who provided technical input in respect of threatened and migratory marine species.

2. SITE DESCRIPTION

The site encompasses a total area of approximately 769 ha. The site previously supported exotic pine plantations and was utilised for forestry purposes. An aerial photograph of the site, taken in 2007, is presented in Figure 2.

The majority of the site is highly disturbed and has been the subject of previous land clearing and plantation forest activities. The site is characterised by large expanses of disturbed grassland, some scattered trees, Paperbark (*Melaleuca quinquenervia*) communities, Eucalypt open forest and areas of marine vegetation which fringe the Caboolture River and associated waterways and constructed drainage channels that are tidally influenced.

The northern sectors of the site:

- adjoin the Deception Bay Declared Fish Habitat area, which extends along the entire length of the northern boundary, within the bounds of the Caboolture River*;*
- are adjacent to the Moreton Bay Marine Park Habitat Zone which ends at the north-eastern boundary of the site; and
- adjoin the Moreton Bay Ramsar Wetlands, which traverse the same area within the Caboolture River as the Moreton Bay Marine Park.

The Caboolture River retains significant features such as fish habitat and remnant riparian vegetation, however there has been obvious alteration of the river by human activities. A key feature of the Caboolture River is the presence of a weir 19km upstream of the river mouth which affects the water quality, particularly salinity and prevents sediment transport from the upper Caboolture River catchment to Moreton Bay.

The health of the Caboolture River has been assessed from 1999 as part of the Ecosystem Health Monitoring Program (EHMP 2005-06). This program issued report cards grading the estuary of the Caboolture River as “D”, which is essentially “poor” in terms of ecological health. The grades also show a gradual decline in health over the period of assessment with the poor grading attributed to both natural and anthropogenic processes.

Natural processes contributing to poor health include impacts associated with flooding, storm surges, nutrients from oceanic upwelling and poor riparian cover and bank stability. Anthropogenic processes contributing to the poor health of Caboolture River includes the alteration of run-off patterns leading to diffuse pollution associated with discharges from agricultural land (for example increased sedimentation in stormwater), residential development (for example unmanaged stormwater runoff) and industry (for example sewage treatment plants).

The lower reaches of the Caboolture River discharge into the shallow marine waters of Moreton Bay. Moreton Bay and its catchment has been the subject to extensive studies on water quality, hydrology, sedimentology and aquatic ecology. The Caboolture River is one of several major rivers that flow into Moreton Bay and has a total catchment area of 589 km^2.

3. PROPOSED PLAN OF DEVELOPMENT

3.1 General Description

NEBP is a multi-use marina and business park concept that will integrate industry, marina facilities, commercial, residential, heritage and recreational open space precincts. The business, tourism and recreation opportunities that will be created by NEBP is expected to boost the local economy via the creation of 3,300 construction jobs as well as 9,000 long term permanent and casual local employment opportunities. In this regard, the integrated business park satisfies the Queensland Government agenda to establish marine industry clusters, jobs and training to Queensland.

Detailed technical studies and consultations with community, as well as local state and Commonwealth government agencies have been undertaken to ensure NEBP is developed in a manner that achieves balanced environmental, social and economic benefits. Technical studies that have been undertaken to assist with development of the NEBP proposal and associated Environmental Impact Statement include:

- environmental, social and economic demand assessments to justify the project proposal and provide alternatives;
- planning assessments to demonstrate how the proposal conforms with State, regional and local plans including an approval strategy framework;
- topographical and boundary surveys to inform the development outline;
- geotechnical analysis to determine land use capacities;
- landscape character and visual amenity studies to protect and enhance existing values;
- stormwater flows and flood modelling to determine impacts on water resources and inform construction methodology and operational aspects;
- coastal process analysis to determine the impact of a marina and dredging on the physical attributes of the Caboolture River and protect coastal processes and values;
- bathymetric surveys of the Caboolture River to determine navigable access to the site;
- air, noise and waste assessments to prevent environmental harm (including environmental nuisance) and achieve policy objectives;
- ecological assessments to determine areas of the site that warrant protection to preserve aquatic and terrestrial ecological attributes;
- cultural heritage assessments to determine areas of the site that warrant protection and restoration;
- social, economic and net benefit assessments to determine complimentary facilities and service types within the NEBP concept to meet community needs and expectations and principles of ecologically sustainable development;
- infrastructure and utility assessments to determine existing capacity, and upgrade requirements; and
- hazard and risk studies to ensure resident and non-resident safety from natural and anthropogenic causes.

Based on the results of these technical investigations a Structure Plan for the NEBP has been developed and a copy of the NEBP Structure Plan is provided as Figure 3. In summary the NEBP makes provision for a number of different land uses precincts within the site. These land use precincts and the areas of land that they occupy are as follows:

- Marine Industry Business Area (MIBA) Precincts, which occupy approximately 168.9 ha or 22% of the site;
- Marina Precincts, which occupy approximately 67.8 ha or 9% of the site;
- Residential Precincts, which occupy approximately 112.6 ha or 15% of the site; and
- Open Space Precincts, which occupy approximately 419.6 ha or 54.6% of the site.

The NEBP's Open Space Precincts provide substantial opportunities for the preservation and enhancement of some of the site's ecological values and functions. Open Space Precincts that are of particular note in this respect are described below.

Precinct 4(3) Open Space – This precinct occupies over 259 ha, or 33%, of the site and is designed to provide a variety of areas and features which achieve a significant range of environmental, social and recreation opportunities. Whilst generally publicly accessible for active and passive recreation, the Open Space Precinct includes areas set aside for active conservation and rehabilitated and revegetated riparian areas. A proposed Environment Centre located adjacent to the main boulevard on the edge of the environmentally sensitive areas along Raff Creek, would provide an educational experience to visitors with links to the conservation areas and the environmental trail network. The buffer zone between the marina basin and the river is proposed to be developed as a riverside parkland providing a more naturally themed contrast and open space alternative to the adjacent urbanised open space components on the other side of the Marina. It will provide significant access to the river for both residents and visitors. An extensive network of cycle and walking tracks is proposed throughout the open space areas providing recreational opportunities and links between the various destinations and attractions. A series of canoe trails proposed by the Caboolture Shire Council integrates with proposed river access to the open space destinations including landing points at the Heritage Park and near the Marina, providing another recreational option and encouraging access to the parklands by water.

Precinct 4(2) Golf Course – This precinct occupies over 148 ha, or 19%, of the site. Upon completion, the NBP Golf Course will comprise 18 holes, and is laid out in a manner which allows for it to be developed in two stages. The golf course design allows pedestrian and cyclist connectivity across the course, enhancing the movement networks with the NEBP. The NEBP golf course utilises the significant waterway corridors of Raff Creek and the minor watercourses between the Marina Precincts and the Residential Precincts. The course includes water features which are part of the broader integrated water management system throughout the NEBP. The inclusion of the golf course and its water features allow water quality enhancement and flow quantity management to limit adverse effects on the riparian environment.

An indication of the nature of the final landform intent for the NEBP, following the completion of development works and habitat enhancement works within the public open space precincts, is provided in Figure 4.

The NEBP development will be a staged development with the majority of activity anticipated to occur over the period from 2008 to 2021.

3.2 Environmental Impacts

Key aspects of the NEBP development are as follows.

1. The NEBP site, situated on the southern bank of the Caboolture River, has an area of approximately 769ha.
2. The majority of the NEBP site (approximately 78%) has been cleared of native vegetation and associated fauna habitat and has historically been used for livestock grazing and plantation pine cultivation.
3. Major landform adjustments that will be required to establish NEBP development, including excavation of the marina basin and a balanced cut/fill operation within the site's Caboolture River flood plain to achieve required flood immunity outcomes for the NEBP development and adjacent properties located within the Caboolture River floodplain.
4. The proposed plan of development will have direct physical impacts on most of the site's terrestrial ecosystems and associated species of native flora and fauna as a consequence of the clearance of native vegetation communities and associated development works. In this respect the relationship between the site's vegetation communities and the patterns of land use proposed within the NEBP Structure Plan is illustrated in Figure 5. Also shown on Figure 5 are the locations of areas where flood mitigation earthworks are required based on the results of a flood study carried out by Parsons Brinckerhoff Australia Pty Ltd.
5. The impact of the NEBP development upon the site's terrestrial ecosystems is variable, with the majority of development occurring with disturbed grassland area, with very limited impact upon some vegetation communities and the complete removal of others. Based on the relationships illustrated in Figure 5, a summary of the impact of the NEBP development upon each of the identified vegetation communities is in Table 1.

Table 1 Extent of vegetation community removal/modification and retention

Vegetation Community	Current Extent (Ha)	Extent to be Removed/Modified (Ha)	% to be Retained
Mixed Marine Vegetation	38.7	2.9	92.5
Paperbark Open Forest	19.9	2.7	86.6
Disturbed Grassland	598.5	394.6	34.1
Cypress Pine Woodland	1.8	1.8	0.00
Disturbed Saltwater Couch Grassland	7.7	2.0	74.0
Swamp Oak Woodland	5.0	5.0	100
Disturbed Mixed Species Woodland	7.1	6.0	15.0
Swampy Heathland	1.5	1.5	0.00
Riparian Vegetation	34.5	0.2	99.3
Cultivated Vegetation	12.9	2.0	84.5
Scribbly Gum Shrubby Open Forest	15.5	12.2	21.3
Regenerating Paperbark Forest	12.6	12.6	0.00
Regenerating *Acacia* dominated woodland	13.4	0.6	95.0
TOTAL	**769**	**442**	**42.5**

6. The proposed plan of development makes provision for the establishment of a network of Open Space Precincts, encompassing 419 hectares or 55% of the site area. The Open Space Precincts will encompasses the majority of the site's open forest, woodland, riparian and wetland habitats. Within these Open Space Precincts there is a commitment to undertake significant ecological rehabilitation and restoration works that are designed to offset the loss, or modification, of ecosystem values that will occur as a consequence of the NEBP development.
7. Approximately 6.5km of the existing navigation channel within the lower reaches of the Caboolture River will be dredged to:
    - ensure safe navigable entrance to the river at all tides facilitating marine traffic for the proposed NEBP marina, and addressing an existing safety concern whereby the safe passage of larger vessels currently restricted to top of navigation tide are not compromised in adverse weather conditions; and
    - increase the outfall of water flows in flood events providing substantial flood mitigation upstream.
8. The navigation dredging works are anticipated to generate approximately 545,300m^3 of dredge spoil which will be pumped to the NEBP site for use as land fill. The anticipated duration of initial dredging activity is a period of approximate 21 months.
9. Dredging modelling of the Caboolture River undertaken by Cardno Lawson and Treloar (2007), indicates that siltation of the Caboolture River will continue to occur, with approximately 220,000 m^3 of material over 5 years accumulating within the defined dredge area. Periodic maintenance dredging of the entire channel will be required at 5 yearly intervals. The anticipated duration of maintenance dredging activities being a period of approximate 9 months, or less than 2 months per annum.
10. The proposed NEBP dry-land marina will have a navigation lock to minimise the potential impacts of the development on the natural tidal prism. The marina's lock system will also provide the capacity to physically isolate the marina from the Caboolture River, which aspect of the marina design confers substantial environmental management advantages (i.e. spill containment).

3.3 Impact Mitigation and Management Strategies

A number of environmental impact mitigation and management strategies are proposed for implementation as part of the NEBP development. A summary of these strategies is provided below.

3.3.1 Land Use Design and Assessment Processes

The NEBP is proposed to be developed under Community Title, guided by a Community Management Scheme. Community Title provides a legal structure allowing for stakeholders in the development to provide detailed local control and management measures tailored to the needs of the development. Such a structure allows for long term control and management of community and environmental assets, allowing them to be maintained to a standard in keeping with the intent of the development.

The NEBP Area Plan, which has been prepared by PMM, is the statutory basis to guide and control development of the NEBP over the lifespan of the project. The NEBP Area Plan is specifically tailored to the NEBP site and comprises a Structure Plan that indicatively designates development precincts. The NEBP Area Plan specifies the development intent for each precinct, overall outcomes, preferred uses, the level of assessment required for future applications, relevant codes and development standards.

3.3.2 Vegetation and Habitat Off-sets

An integral component of the NEBP development is the provision of environmental off-sets to compensate for the clearance of some areas of existing vegetation and fauna habitat that is required for the NEBP development to proceed. Vegetation and habitat offset that form part of the NEBP proposal include the following.

a. The provision of a vegetation offset in accordance with Department of Natural Resources and Water's *Policy for Vegetation Management Offsets - 23 August 2007* in respect of the clearance of approximately 13 ha of remnant vegetation in the south-western sector of the site. In this respect North East Business Park Pty Ltd have, in consultation with the Department of Natural Resources and Water, secured an appropriate off-set that satisfies the policy requirements.

b. The establishment and on-going maintenance of substantial revegetation and habitat enhancement works within the NEBP Open Space precincts. These works will be carried out in general accord with the Landscape Master Plan Report (LMPR), prepared by PLACE Planning and Design. The LMPA provides a conceptual framework for the Open Space and Recreation Areas included in the NEBP development. The LMPR aims to achieve considerable benefits to the environment and community through the:

   - extensive rehabilitation of degraded habitats within the site, including the Caboolture River riparian zone;
   - enhancement of the ecological values and health of open space areas;
   - protection on ecological values and function of the Caboolture River and ultimately Moreton Bay;
   - weed control and management;
   - controlled public access for the enjoyment of the environmentally sensitive areas (i.e. Caboolture River);
   - provision of local job opportunities in the fields of landscape construction, landscape maintenance, revegetation and environmental rehabilitation;
   - provision of cooperative partnership arrangements and other opportunities for community based groups such as Caboolture Regional Environmental Education Centre (CREEC) to contribute in a mutually beneficial way to the development of the site; and
   - the implementation of Water Sensitive design (WSUD) and Crime Prevention Through Environmental Design (CPTED) principles.

In addition to these measures, the potential use of material dredged from the Caboolture River navigation channel to create additional high tide roost sites for migratory wading birds will be investigated in consultation with the EPA.

3.3.3 General Environmental Management

The NEBP development will be managed in accordance with a number of management plans that have been prepared in respect of specific aspects and/or phases of the development. These management plans include the following.

1. A Construction Environmental Management Plan (CEMP), that has been prepared as part of the NEBP EIS to detail the environmental management measures which will be adopted during the construction of the NEBP. The CEMP incorporates the mitigation measures that have been recommended in the EIS technical reports. In particular, the CEMP provides mechanisms in which the environmental performance of the NEBP construction works can be measured and, if required, provides procedures for

identifying and implementing corrective actions. The CEMP considers a number of issues including:

- Earthworks Management;
- Erosion and Sedimentation Control;
- Water Quality Management;
- Flora and Fauna Management;
- Weed Control;
- Mosquito and Biting Midge Management;
- Waste Management;
- Dangerous and Hazardous Materials Management; and
- Traffic Management.

2. An Acid Sulfate Soil Management Plan (ASSMP), which has been prepared to detail the procedures for the management of acid sulfate soils likely to be disturbed through civil bulk earthworks and Caboolture River dredging associated with the NEBP development proposal. The ASSMP specifies management performance objectives, control measures and monitoring requirements based on the findings of the geotechnical investigations. The ASSMP has been designed to ensure that no significant adverse impact on the receiving environment occur as a result of the disturbance of actual or potential acid sulfate soils.
3. A Dredging Site Based Management Plan (Dredging SBMP), which outlines the potential impacts of Caboolture Rive navigation channel dredging activities and specifies mechanisms that will be incorporated to ensure environmental impacts associated with the dredging and spoil disposal are minimised as far as practicable.
4. A Site Based Management Plan (SBMP) for various environmentally relevant activities (ERAs), associated with the NEBP marina and marine industry precincts, including ERA 11 'crude oil or petroleum product storing', ERA 19 'dredging' (i.e. maintenance dredging), and ERA 73 'marina or seaplane mooring'. The SBMP also provides an overarching framework for best practice environmental management for other ERAs that may be undertaken within the NEBP's marine industries precinct such as abrasive blasting (ERA 23), metal surface coating (ERA 25) and motor vehicle workshop (ERA 28).
5. A Stormwater Management Plan, prepared by Parsons Brinckerhoff Australia Pty Ltd, which provides a stormwater quality management strategy to be adopted to achieve the Caboolture Shire Council's pollution reduction targets and the Queensland Water Quality Objectives (WQO) for the Caboolture River.
6. A Landscape Master Plan Report, prepared by PLACE Planning and Design, which provides a conceptual framework for the Open Space and Recreation Areas included in the NEBP development.

4. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The *Environment Protection and Biodiversity Conservation Act 1999* ("the *EPBC Act*") requires that a person must receive Commonwealth approval for any action that has, will have, or is likely to have a significant impact on matters of national environmental significance. Matters of national environmental significance that are recognised by the *EPBC Act* and which can act as a trigger for the Commonwealth assessment and approval process include:

- World Heritage properties;
- National Heritage Places;
- Ramsar wetlands of international significance;
- Nationally threatened species and communities;
- Migratory species protected under international agreements;
- Nuclear actions, including uranium mining; and
- The Commonwealth marine environment.

Matters of National Environmental Significance (NES) recognised by the *EPBC Act* that occur within and adjacent to land and water to be affected by the proposed development include:

a. the Ramsar listed wetlands of Moreton Bay;

b. known and potential habitat for a diversity of listed threatened species; and

c. known and potential habitat for a diversity of migratory species listed under international agreements, including:

    - appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) for which Australia is a Range State under the Convention;
    - the Agreement between the Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment (CAMBA); and
    - the Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA).

In respect of these Matters of NES, Figure 6 presents a map of the NEBP locality illustrating the spatial relationship between the NEBP development site, the Caboolture River navigation channel, the Ramsar listed wetlands of Moreton Bay and important shore bird habitat areas recognised by the Queensland Environmental Protection Agency.

A more detailed description of the above matters of NES and an assessment of the likelihood that the proposed NEBP development would have a significant impact upon these matters is provided below.

4.1 Wetlands of International Importance

The eastern portion of the site's northern boundary adjoins the Moreton Bay Ramsar wetlands. The Moreton Bay Ramsar wetlands is situated immediately east of the City Of Brisbane and extends in a north-east and south-east direction and encompass a total area of approximately 113,314 ha. Moreton Bay is approximately 80 km long and 35 km wide in the north and less than 5 km wide in the south. The general ecological values of the Moreton Bay Ramsar wetlands include the following.

1. Moreton Bay represents one of Australia's largest estuarine bays which are enclosed by a barrier island of vegetated sand dunes.
2. Moreton Bay supports intertidal areas of mangroves, seagrass and saltmarsh which provide habitat for water birds. These intertidal areas represent one of only three such areas on the east coast of Australia.
3. Moreton Bay supports at least 43 species of shorebirds including 30 migratory species listed by JAMBA and CAMBA, 55 species of algae associated with mangroves, over 355 species of marine invertebrates, seven species of seagrass and seven species of mangroves. In addition, Moreton Bay supports greater than 50 000 wintering and staging birds during the non-breeding season.
4. Moreton Bay provides foraging and habitat resources for the Dugong and several threatened turtle species.

A detailed description of the ecological character of the Ramsar listed wetlands of Moreton Bay, obtained from the Australian Wetlands Database at: www.deh.gov.au/water/wetlands/database/index.html, is reproduced in Appendix A.

4.1.1 Potential impacts and proposed mitigation measures

As illustrated in Figure 6, the mapped limits of the Ramsar listed wetlands of Moreton Bay extend into the Caboolture River to a point immediately upstream of the proposed marina entrance channel. This section of the RAMSAR listed wetlands of Moreton Bay is currently used by recreational and some commercial boating traffic, which utilises and existing navigation channel within the Caboolture River. This includes boating activity associated with the existing Monty's marina located immediately down stream of the site.

Several aspects of the NEBP development have the potential to impact both directly and indirectly upon the ecological character of the Caboolture River and Moreton Bay. Aspects of the NEBP development that will have a direct impact upon the existing character of the Caboolture River include:

- the establishment of a marina entrance channel through the banks of the Caboolture River;
- dredging of the existing Caboolture River navigation channel;
- increases in the volume of boasting traffic utilising the Caboolture River;
- alterations to the water qualities of the Caboolture River during the construction and operational phases of the NEBP development; and
- revegetation and stabilisation of the banks of the NEBP site's Caboolture River frontage.

In respect of these potential impacts the NEBP proposal incorporates a number of impact avoidance, mitigation and management strategies as detailed in Section 3.3 herein.

4.1.2 Impact significance assessment

Approval is required for an action occurring within or outside a declared Ramsar wetland if the action has, will have, or is likely to have a significant impact on the ecological character of the Ramsar wetland. The 'ecological character' is the combination of the ecosystem components, processes and benefits/services that characterise the wetland at the time of designation for the Ramsar List. In this respect the key ecological characteristics of the Ramsar listed wetlands of Moreton Bay are:

1. the fact that Moreton Bay is one of Australia's largest estuarine bays enclosed by a barrier island of vegetated sand dunes, a characteristic that will in no way be affected by the NEBP development;
2. the extensive intertidal areas of mangroves, seagrass and saltmarsh which provide habitat for water birds;
3. the presence of a diverse assemblage of shorebirds, algae associated with mangroves, marine invertebrates, seagrass and mangrove species; and
4. foraging and habitat resources for the Dugong and several threatened turtle species.

TABLE 1: Compliance Assessment in respect of the *EPBC Act* performance criteria dealing with Ramsar wetlands of international importance.

Performance Criteria	Response
The action should not result in areas of the wetland being destroyed or substantially modified.	The NEBP development will not result in the destruction of any areas of the Ramsar listed wetlands of Moreton Bay. Some physical modifications to the Caboolture River will occur as a consequence of the dredging of the existing navigation channel and the construction of the marina entrance. The nature and scale of these modifications is not considered to be such that there would be any discernible impact upon the key ecological characteristics of the Ramsar listed wetlands. The NEBP site layout and development proposal, which largely occur outside of the formal boundaries of the Ramsar wetland, does make substantial provision for the appropriate management of on-site wetland habitats that contribute to the Ramsar values of adjacent sectors of the Caboolture River.
The action should not result in a substantial and measurable change in the hydrological regime of the wetland for example, a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland.	The NEBP development has been specifically designed to minimise alterations to the hydrology and water qualities of the Caboolture River and Moreton Bay. In this respect the following aspects of the NEBP proposal are noted: • the proposed marina is to be physically isolated from the Caboolture River via a lock structure to avoid any significant change to the tidal prism of the Caboolture River; and • the NEBP site development has been specifically designed to minimise alterations to flood flow levels within the Caboolture River, both upstream and downstream of the site.

Performance Criteria	Response
The action should not result in the habitat or lifecycle of native species dependant upon the wetland being seriously affected.	The NEBP development will not result in the habitat or lifecycle of native species dependant upon the wetland being seriously affected. Additional consideration of the potential impact of the NEBP proposal upon wetland dependent species is provided in Sections 4.2 to 4.5 herein.
The action should not result in a substantial and measurable change in the physico-chemical status of the wetland for example, a substantial change in the level of salinity, pollutants, or nutrients in the wetland, or water temperature which may adversely impact on biodiversity, ecological integrity, social amenity or human health.	The NEBP is not likely to result in any substantial changes in the physico-chemical status of the Caboolture River and Moreton Bay that would adversely impact on biodiversity, ecological integrity, social amenity or human health. In this respect the NEBP development would be carried out in accordance with a number of detailed environmental management plans that have been developed to specifically address water quality issues associated with the construction and operational phases of development. In fact the overall intent of the NEBP development is to achieve an improvement in the qualities of water that currently enter the Caboolture River from the site.
The action should not result in an invasive species that is harmful to the ecological character of the wetland being established in the wetland.	The NEBP development will not result in an invasive species that is harmful to the ecological character of the Caboolture River or Moreton Bay being established in the wetland. In fact the NEBP development will provide means of: a. actively managing existing infestations of pest flora and fauna species that occur within the NEBP site and which are having an adverse impact on the ecological character of the site locality; and b. ensuring that the potential for invasive marine species to be introduced to the locality is minimised by establishing a state of the art marina facility with best practice environmental management.

4.2 Threatened Species – Terrestrial

Based on field observations and a review of the Qld Environmental Protection Agency's Wildlife Online database (the EPA Database) and the Commonwealth Department of Environment and Water Resources (DEWR) EPBC Protected Matters Search Tool (the DEWR Database), for a 10km search radius from the centre of the site, the NEBP project has the potential to affect: the following species of threatened terrestrial fauna and flora.

Threatened flora, a total of nine (9) species being:

- the *Endangered* Lesser swamp-orchid (*Phaius australis*);
- the *Vulnerable* Bopple Nut (*Macadamia ternifolia*);
- the *Vulnerable* Bush Nut (*Macadamia integrifolia*);
- the *Vulnerable* Glass House Mountains Hop Bush (*Dodonaea rupicola*);
- the *Vulnerable* Leafless Tongue Orchid (*Cryptostylis hunteriana*);
- the *Vulnerable* Three-leaved Bosistoa (*Bosistoa transversa*);
- the *Vulnerable* Heart-leaved Bosistoa (*Bosistoa selwynii*);
- the *Vulnerable* Hairy Joint Grass (*Arthraxon hispidus*); and
- the *Vulnerable Acacia attenuata.*

Threatened mammals, a total of four (4) species being:

- the *Vulnerable* Water mouse (*Xeromys myoides*);
- the *Vulnerable* Grey-headed flying fox (*Pteropus poliocephalus*);
- the *Vulnerable* Large-eared pied bat (*Chalinolobus dwyeri*); and
- the *Vulnerable* Long-nosed potoroo (*Potorous tridactylus*).

Threatened birds, a total of ten (10) species being:

- the *Critically Endangered** Coxen's Fig-Parrot (Cyclopsitta diophthalma coxenii)
- the *Vulnerable* Red Goshawk (*Erythrotriorchis radiatus*);
- the *Vulnerable* Australian Painted Snipe (*Rostratula australis*);
- the *Endangered* Swift Parrot (*Lathamus discolor*);
- the *Endangered** Regent Honeyeater (*Xanthomyza phrygia*);
- the *Vulnerable* Squatter Pigeon, southern sub-species (*Geophaps scripta scripta*);
- the *Endangered** Southern Giant-Petrel (*Macronectes giganteus*);
- the *Vulnerable** Northern Giant-Petrel (*Macronectes hallii*);
- the *Vulnerable* Black-breasted Button-quail (*Turnix melanogaster*);
- the *Vulnerable** Campbell Albatross (*Thalassarche impavida*); and
- the Vulnerable Kermadec petrel (*Pterodroma neglecta neglecta*).

(note: * - species also listed as a Migratory species pursuant to the *EPBC Act*).

One (1) threatened reptile being the *Vulnerable* Three-toed Snake-tooth Skink (*Coeranoscincus reticulatus*).

Two (2) threatened frog species being the:

- *Endangered* Giant Barred Frog (*Mixophyes iteratus*); and
- *Vulnerable* Wallum Sedge Frog (*Litoria olongburensis*).

One (1) threatened insect being the *Endangered* Australian Fritillary (*Argyreus hyperbius inconstans*) butterfly.

A copy of the DEWR and EPA database searches are provided in Appendix B and Appendix C respectively.

Appendix D provides a profile for each of these species including a summary of relevant details concerning:

- the general ecology of the species including consideration of its critical habitat requirements, feeding and breeding behaviours;
- the distribution and abundance of the species;
- recognised threats to the viability of populations of the species;
- the likelihood of the species utilising areas to be affected by the NEBP project;
- the nature and significance of potential impacts of the NEBP project upon the viability of local populations of the species; and
- impact mitigation measures that are proposed as part of the NEBP project that the species may benefit from.

Section 4.2.1 provides details concerning the potential impacts of the NEBP development upon threatened marine species and measures that are [proposed to mitigate the potential for, or consequences of, such impacts.

Section 4.2.2 provides an assessment of the significance of potential impacts that may arise from the NEBP development with reference to the criteria specified in EPBC Act Policy Statement 1.1 - Significant Impact Guidelines - Matters of National Environmental Significance (May 2006). For the purpose of this assessment the Endangered Species criteria have been adopted.

4.2.1 Potential impacts and proposed mitigation measures

The NEBP development has the potential to impact upon threatened terrestrial flora and fauna through a combination of direct and indirect impacts upon existing ecosystem types that occur in the site locality. In this respect it is noted that:

- the majority of the proposed NEBP development is a highly modified environment;
- the proposed plan of development concentrates development activities within the more heavily disturbed sectors and the site and makes provision for the preservation of the majority of areas with a relatively high conservation value; and
- the proposal makes a substantial provision for environmental management and enhancement within the Open Space Precincts which encompass approximately 55% of the site area.

As detailed in Appendix D, the majority of threatened terrestrial species that have been recorded within 10 km of the NEBP site are unlikely to be affected by the NEBP development. This assessment is based on consideration of the species habitat requirements, likelihood of occurrence within areas to be affected by the NEBP development, sensitivity to adverse impacts that may arise from the NEBP development and the nature of impact avoidance/mitigation measures that are to be implemented as part of the NEBP development.

The only threatened terrestrial species considered to have a high probability of utilising areas to be affected by the NEBP is the *Vulnerable* Grey-headed flying fox (*Pteropus poliocephalus*). In respect of this species the NEBP development is unlikely to have a significant adverse impact given that:

- the majority of existing habitat resources would be maintained; and
- substantial areas of additional habitat would be created within then proposed Open Space precincts.

4.2.2 Impact significance assessment

Based on the information presented above and in Appendix D an assessment of the likelihood of the NEBP development having a significant impact upon threatened terrestrial species is provided in Table 2.

TABLE 2: Compliance Assessment in respect of the *EPBC Act* performance criteria dealing with threatened terrestrial species.

Performance Criteria	Response
The action should not lead to a long-term decrease in the size of a population.	The NEBP development is not likely to cause a long-term increase in the size of any population of any threatened terrestrial species. The NEBP proposal provides opportunities, via a combination of habitat retention and enhancement, for enhancing the long-term viability of local populations of a number of threatened wildlife species such as Lesser Swamp Orchid (*Phaius australis*) and Australian Fritillary (*Argyreus hyperbius inconstans*).
The action should not reduce the area of occupancy of the species.	The NEBP development is not likely to reduce the area of occupancy of any threatened terrestrial species.
The action should not fragment an existing population into two or more populations.	The NEBP development is not likely to fragment an existing population of any threatened terrestrial species into two or more populations.
The action should not adversely affect habitat critical to the survival of a species.	The NEBP development is not likely to adversely affect habitat critical to the survival of a threatened terrestrial fauna species.
The action should not disrupt the breeding cycle of a population.	The NEBP development is not likely to disrupt the breeding cycle of a population of any threatened terrestrial species.
The action should not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The NEBP development is not likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that a threatened terrestrial species is likely to decline. The NEBP proposal provides opportunities, via a combination of habitat retention and enhancement, for improving the long-term viability of local populations of a number of threatened terrestrial wildlife species such as Lesser Swamp Orchid (*Phaius australis*) and Australian Fritillary (*Argyreus hyperbius inconstans*).
The action should not result in invasive species that are harmful to a threatened species	The NEBP proposal will result in the active management of weeds and vertebrate pest species that currently exist on the NEBP site and which are likely contributors to the general absence of threatened terrestrial species on the NEBP site.

Performance Criteria	Response
becoming established in the species´ habitat.	
The action should not interfere with the recovery of the species.	The NEBP would no interfere with the recovery of any threatened terrestrial species and has the capacity to make a positive contribution towards the recovery of populations of several threatened terrestrial species via a combination of habitat retention, habitat enhancement and environmental education.

4.3 Threatened Species – Marine

Based on field observations and a review of the EPA Database and the DEWR Database, for a 10km search radius from the centre of the site, the NEBP project has the potential to affect eight (8) threatened marine species. These species are:

- the *Critically Endangered* Grey nurse shark (*Carcharius taurus*);
- the *Endangered* Loggerhead turtle (*Caretta caretta*);
- the *Endangered* Pacific ridley (*Lepidochelys olicacea*);
- the *Vulnerable* Green turtle (*Chelonia mydas*);
- the *Vulnerable* Leatherback turtle (*Dermochelys coriacea*);
- the *Vulnerable* Honey blue-eye (*Pseudomugil mellis*;
- the *Vulnerable* Great white shark (*Carcharadon carcharius*); and
- the *Vulnerable* Whale shark (*Rhincodon typus*).

Appendix D provides a profile for each of these species including a summary of relevant details concerning:

- the general ecology of the species including consideration of its critical habitat requirements, feeding and breeding behaviours;
- the distribution and abundance of the species;
- recognised threats to the viability of populations of the species;
- the likelihood of the species utilising areas to be affected by the NEBP project;
- the nature and significance of potential impacts of the NEBP project upon the viability of local populations of the species; and
- impact mitigation measures that are proposed as part of the NEBP project that the species may benefit from.

Section 4.3.1 provides details concerning the potential impacts of the NEBP development upon threatened marine species and measures that are [proposed to mitigate the potential for, or consequences of, such impacts.

Section 4.3.2 provides an assessment of the significance of potential impacts that may arise from the NEBP development with reference to the criteria specified in *EPBC Act* Policy Statement 1.1 - Significant Impact Guidelines - Matters of National Environmental Significance (May 2006). For the purpose of this assessment the Endangered Species criteria have been adopted.

4.3.1 Potential impacts and proposed mitigation measures

There would be large vessels utilising the proposed development, thereby increasing boat traffic in the Caboolture River and the potential for boat strike to some marine species. Species that may occur on or near the surface, such as marine turtles, are most vulnerable to boat strike although such incidences are rare when vessels are not travelling fast. Currently there are large vessels berthed at private moorings upstream of the proposed marina entrance and at Monty's Marina, which is just downstream of the proposed marina entrance. Thus, there are already relatively large vessels within the river. The river is also subject to speed limits. Provided that vessels stay within the appropriate navigation channels (i.e. in deeper water) and observe the speed limit, the likelihood of boat strike would be small.

The design of the proposed development is such that direct physical disturbance to the Caboolture River would be confined to the marina entrance, with most of the foreshore of the property protected, and in the existing navigation channel at the mouth of the Caboolture River. There would however be potential for the proposal to affect the ecology of the river indirectly and adjacent areas of Moreton Bay by affecting water quality. Water quality could potentially be affected as a consequence of construction, by polluted runoff

from the completed development and from bank erosion caused by increased vessel traffic, Decreased water quality has potential to affect threatened species by degrading their habitats or by affecting their food sources. Best practice methods in management of water, potential spillages, etc. on the site should ensure minimal impacts on water quality from the proposed development. It is understood that, as part of the design of the project, there is an opportunity to use some of the treated water from the Caboolture WWTP to irrigate the golf courses and other open space areas on the study site. This opportunity provides a significant potential benefit to the local marine environment by helping to reduce the high levels of nutrients already present and known to be affecting the ecology of the river and potentially the adjacent areas of Moreton Bay.

4.3.2 Impact significance assessment

Based on the information presented above and in Appendix D an assessment of the likelihood of the NEBP development having a significant impact upon threatened marine species is provided in Table 3.

TABLE 3: Compliance Assessment in respect of the *EPBC Act* performance criteria dealing with threatened marine species.

Performance Criteria	Response
The action should not lead to a long-term decrease in the size of a population.	It is unlikely that a viable local population of any of the listed species exists in the section of the Caboolture River potentially affected by the proposed marina. Most of the listed species would forage there only occasionally. Given that potential impacts of the proposed marina to the ecology of the river, and the potential of vessel-strike to large fauna, would be minimal and that viable local populations of threatened species are unlikely to occur, the proposal should not lead to a long-term decrease in the size of a population of any of the listed species. Honey blue-eye were not sampled as part of the investigations for the EIS, but it is possible that a viable population does occur in the Caboolture River. This species is likely to occur in freshwaters upstream of the weir and in the upper parts of some of the creeks (e.g. King John Creek, Goong Creek and Raff Creek). Raff Creek would be maintained as part of the proposed development thus, if honey blue-eye did occur there, their population should be conserved.
The action should not reduce the area of occupancy of the species.	Given that direct physical disturbance to the Caboolture River would be confined to the marina entrance, only a very small portion of the river, if any, would be removed. Potentially, disturbance from increased vessel traffic may cause some individuals to avoid the area but as threatened species are unlikely to reside in the area, or require it to breed, avoidance of the area would not constitute a significant reduction to the area of occupancy of any species.
The action should not fragment an existing population into two or more populations.	The parts of the Caboolture River above and below the proposed marina would not be disconnected as a consequence of the proposal.

Performance Criteria	Response
The action should not adversely affect habitat critical to the survival of a species.	The Caboolture River could potentially provide foraging habitat for the threatened species listed above and potentially an area of residence for honey blue-eye (although this species is more generally found in freshwater). However, as the habitat is not critical to the survival of any of the listed species and potential impacts, if any, would be minimal, there would be no adverse effect.
The action should not disrupt the breeding cycle of a population.	Most of the species listed are unlikely to breed in the section of the Caboolture River potentially affected by the proposed development. Whilst not recorded during the study, honey blue-eye could potentially breed in the upper portion of Raff Creek. As this creek will be retained within the development, the action should have little or no effect on honey blue-eye, assuming that they may utilise Raff Creek.
The action should not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	As described above, there would be little potential for the project to modify or destroy habitat used by threatened species. In addition, given that the listed threatened species would generally use the potentially affected area of the river occasionally only, it is unlikely that the proposal would cause a decline in a population of any of the species.
The action should not result in invasive species that are harmful to a threatened species becoming established in the species´ habitat.	Construction and ongoing activity of the proposed development is unlikely to result in the establishment of invasive species in the area.
The action should not interfere with the recovery of the species.	Construction and ongoing activity of the proposed marina would not affect recovery plans for any of the listed threatened species.

4.4 Migratory Species – Terrestrial

Based on field observations and a review of the EPA Database and the DEWR Database, for a 10km search radius from the centre of the site, the NEBP project has the potential to affect twenty-four (24) migratory terrestrial species. All of the listed terrestrial migratory species are birds that are subject to the JAMBA and/or CAMBA agreements. Five (5) of these species are also listed as threatened species and have previously been considered in Section 4.2.

Appendix D provides a profile for each of these species including a summary of relevant details concerning:

- the general ecology of the species including consideration of its critical habitat requirements, feeding and breeding behaviours;
- the distribution and abundance of the species;
- recognised threats to the viability of populations of the species;
- the likelihood of the species utilising areas to be affected by the NEBP project;
- the nature and significance of potential impacts of the NEBP project upon the viability of local populations of the species; and
- impact mitigation measures that are proposed as part of the NEBP project that the species may benefit from.

Section 4.4.1 provides details concerning the potential impacts of the NEBP development upon threatened marine species and measures that are proposed to mitigate the potential for, or consequences of, such impacts.

Section 4.4.2 provides an assessment of the significance of potential impacts that may arise from the NEBP development with reference to the criteria specified in *EPBC Act* Policy Statement 1.1 - Significant Impact Guidelines - Matters of National Environmental Significance (May 2006).

4.4.1 Potential impacts and proposed mitigation measures

The majority of terrestrial migratory species that are known, or considered likely, to utilise habitat resources in the vicinity of the NEBP development are shorebirds. Potential impacts of the NEBP development upon these migratory bird species include:

- direct physical loss or modification of habitat; and
- indirect degradation of habitat values as a consequence of activities associated with the NEBP development, including Caboolture River dredging.

In respect of these issues it is noted that there would be no significant loss of habitat for migratory birds as a consequence of the NEBP development. Whilst some migratory bird species would utilise parts of the NEBP site that will be developed it is relevant to note that:

- no part of the NEBP site is recognised as an important shore bird habitat area by the Queensland Environmental Protection Agency (QEPA);
- the majority of on-site shorebird habitat will be retained within the Open Space Precincts, where its values will be enhanced through the management of weed species, feral pests (e.g. pigs), removal of livestock and additional planting of native vegetation within previously cleared areas;
- within the Open Space precincts appropriate controls will be placed over activities that have the potential to disturb or adversely affect migratory bird species (e.g. restrictions on un-leashed dogs); and

- as part of the NEBP proposal an Environment Centre will be established to provide residents of, and visitors to, the locality with information concerning the environmental values of the site locality, the Caboolture River and Moreton Bay.

In respect of the impact of the NEBP proposal on areas recognised the QEPA as important shore bird habitat, it is noted that:

- the existing Caboolture River navigation channel traverses an area of general shore bird habitat and is located approximately 300 metres to the north-east of a critical high tide roost site;
- shore bird populations that utilise these areas are accustomed to the presence of a navigation channel within the Caboolture River, the presence of boating traffic and associated disturbance due to noise emissions etc;
- existing restrictions on vessel speeds and movement patterns within the Caboolture River navigation channel will be maintained;
- primary and maintenance dredging of the existing Caboolture River navigation channel will be carried out in a manner that minimises the potential for disturbance to migratory shore birds that utilise the critical high tide roost site to the south of the navigation channel; and
- appropriate environmental controls will be implemented during the construction and operational phases of the development to ensure the water qualities of the Caboolture River and Moreton Bay are not adversely affected and thereby potential indirect adverse impacts on migratory shore birds are avoided.

4.4.2 Impact significance assessment

Based on the information presented above and in Appendix D an assessment of the likelihood of the NEBP development having a significant impact upon terrestrial migratory species is provided in Table 4.

TABLE 4: Compliance Assessment in respect of the *EPBC Act* performance criteria dealing with terrestrial migratory species.

Performance Criteria	Response
The action should not substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.	The NEBP development will not modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species. In this respect specific consideration has been given in the design of the NEBP development
The action should not result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	The NEBP development will not result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species. In fact the NEBP development includes provisions for the control of weed and vertebrate pest species that currently occur on the site and which have the potential to degrade the locality's ecological values.

Performance Criteria	Response
	Provision is also made within the NEBP management plans for the management of any new invasive species that may be identified.
The action should not seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	The NEBP development will not seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species. In this respect the main aspect of the NEBP development that has a real potential to disrupt migratory shore birds is the dredging of the existing Caboolture River navigation channel. In this respect it is noted that significant adverse impacts will be avoided by restricting the timing of dredging activities to avoid periods of the year when migratory shore birds are residing in the site locality (i.e. September to March). When dredging cannot be avoided during this period, dredging will be avoided during high tide periods if the adjacent critical high tide roost site is being utilised.

Notes:

An area of 'important habitat' for a migratory species is:
a) habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; and/or
b) habitat that is of critical importance to the species at particular life-cycle stages; and/or
c) habitat utilised by a migratory species which is at the limit of the species range; and/or
d) habitat within an area where the species is declining.

Given that listed migratory species cover a broad range of species with different life cycles and population sizes, what constitutes an 'ecologically significant proportion' of the population varies with the species (each circumstance will need to be evaluated). Some factors that should be considered include the species' population status, genetic distinctiveness and species specific behavioural patterns (for example, site fidelity and dispersal rates).

4.5 Migratory Species - Marine

Based on field observations and a review of the EPA Database and the DEWR Database, for a 10km search radius from the centre of the site, the NEBP project has the potential to affect: 8 migratory marine species. Five (5) of these species are also listed as threatened species and have previously been considered in Section 4.2 herein. The remaining migratory marine species considered herein are:

- Dugong (*Dugong dugon*);
- Irrawaddy dolphin (*Orcaella brevirostris*); and
- Indo-Pacific humpback dolphin (*Sousa chinensis*).

Appendix D provides a profile for each of these species including a summary of relevant details concerning:

- the general ecology of the species including consideration of its critical habitat requirements, feeding and breeding behaviours;
- the distribution and abundance of the species;
- recognised threats to the viability of populations of the species;
- the likelihood of the species utilising areas to be affected by the NEBP project;
- the nature and significance of potential impacts of the NEBP project upon the viability of local populations of the species; and
- impact mitigation measures that are proposed as part of the NEBP project that the species may benefit from.

Section 4.5.1 provides details concerning the potential impacts of the NEBP development upon threatened marine species and measures that are [proposed to mitigate the potential for, or consequences of, such impacts.

Section 4.5.2 provides an assessment of the significance of potential impacts that may arise from the NEBP development with reference to the criteria specified in *EPBC Act* Policy Statement 1.1 - Significant Impact Guidelines - Matters of National Environmental Significance (May 2006).

4.5.1 Potential impacts and proposed mitigation measures

The Caboolture River is not part of a recognised migratory corridor for marine fauna. Nevertheless migratory species may forage there occasionally and hence may be at risk to boat strike. Species that may occur on or near the surface, such as dugong and marine turtles, are most vulnerable to boat strike although such incidences are rare when vessels are not travelling fast. As discussed earlier (Section 4.3.1) the likelihood of boat strike to susceptible migratory species would increase in accordance with increased boat traffic but remain a low risk as traffic in the river is already subject to speed limits.

Other activities associated with the proposal have little potential to affect migratory species as they are only likely to occur there occasionally. Although there is some potential for the proposal to result in decreased water quality in the river best practice methods in management of water, potential spillages, etc. on the site should ensure minimal impacts on water quality from the proposed development. As already discussed (Section 4.3.1) it is understood that, as part of the design of the project, there is an opportunity to use some of the treated water from the Caboolture WWTP to irrigate the golf courses and other open space areas on the study site. This opportunity provides a significant potential benefit to the local marine environment by helping to reduce the high levels of nutrients already present and known to be affecting the ecology of the Caboolture River and adjacent areas of Moreton Bay.

4.5.2 Impact significance assessment

Based on the information presented above and in Appendix D an assessment of the likelihood of the NEBP development having a significant impact upon marine migratory species is provided in Table 5.

TABLE 5: Compliance Assessment in respect of the *EPBC Act* performance criteria dealing with marine migratory species.

Performance Criteria	Response
The action should not substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.	As migratory species are likely to occur only occasionally in the Caboolture River, the river is not considered to provide important habitat to migratory marine species. Given the limited potential of the proposal to affect the ecology of the river it is considered that any potential effects to the habitat of migratory species would be negligible, if any. Further, the proposal would have potential to improve habitat by reducing current anthropogenic nutrient input to the river (see above) and to enhance flushing capabilities by restoring the entrance profile to previous depths.
The action should not result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	Construction and ongoing activity of the proposed marina is unlikely to result in the establishment of invasive species in the area that would be harmful to migratory species.
The action should not seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	In the worst case, individuals occasionally foraging or resting in the Caboolture River have potential to be injured or, at the least, disturbed by the increased boat traffic that would occur under the proposal. However, given that these instances are most likely to be rare and would only involve a few individuals at most from a population, this would not be an ecologically significant proportion of the population.

Notes:

An area of 'important habitat' for a migratory species is:
a) habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; and/or
b) habitat that is of critical importance to the species at particular life-cycle stages; and/or
c) habitat utilised by a migratory species which is at the limit of the species range; and/or
d) habitat within an area where the species is declining.

Given that listed migratory species cover a broad range of species with different life cycles and population sizes, what constitutes an 'ecologically significant proportion' of the population varies with the species (each circumstance will need to be evaluated). Some factors that should be considered include the species' population status, genetic distinctiveness and species specific behavioural patterns

5. CONCLUSIONS

The NEBP development (or action) was referred to the Department of Environment and Heritage (DEH) on the 29th of June 2006 for the Minister to determine whether Commonwealth approval is required for the action. A Decision notice was issued on the 12 July 2006 notifying that the proposal is a controlled action (i.e. requires Commonwealth approval) pursuant to Part 3, Division 1, of the *EPBC Act*. The controlling provisions were determined to be:

- Sections 16 and 17B (Wetlands of international importance);
- Sections 18 and 18A (Listed threatened species and communities); and
- Sections 20 and 20A (Listed migratory species).

This report provides an assessment of the likely significance of impacts of the NEBP development upon relevant Matters of NES including consideration of:

a. the ecological characteristics of the Ramsar listed wetlands of Moreton Bay which extend up the Caboolture River to the NEBP development site;

b. known and potential habitat for a diversity of listed threatened species, including 27 terrestrial and 8 marine (aquatic) species; and

c. known and potential habitat for a diversity of migratory species, including 24 migratory bird species and 3 migratory marine species.

It is the conclusion of this assessment that the NEBP development is not, when consideration is given to existing site conditions and the overall effect of proposed impact mitigation and management strategies, likely to have a significant adverse impact on any Matters of NES.

FIGURES

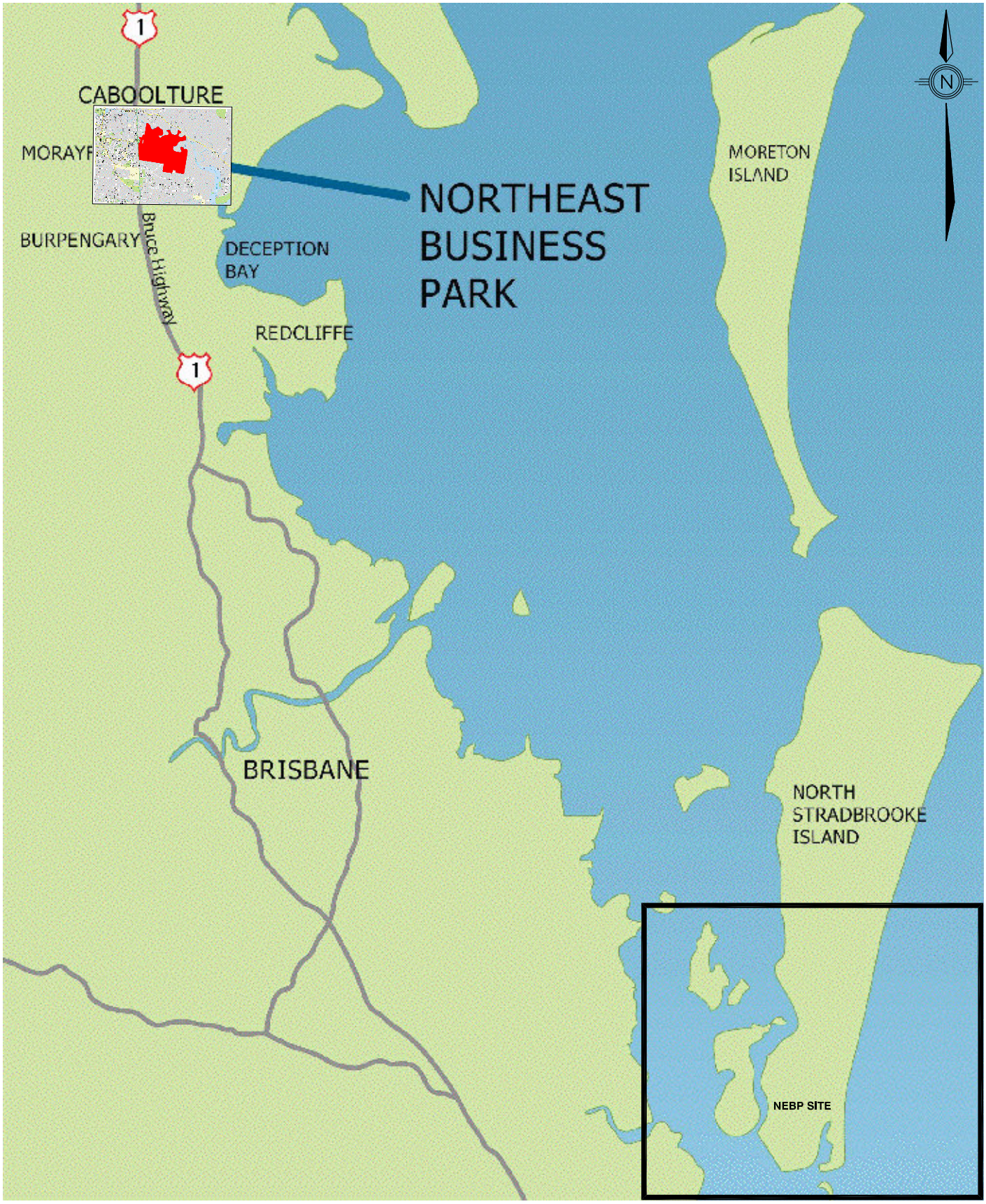


Image sourced from KINGFISHER CREATIVE, October 2007

Not To Scale

FIGURE 1
LOCALITY PLAN

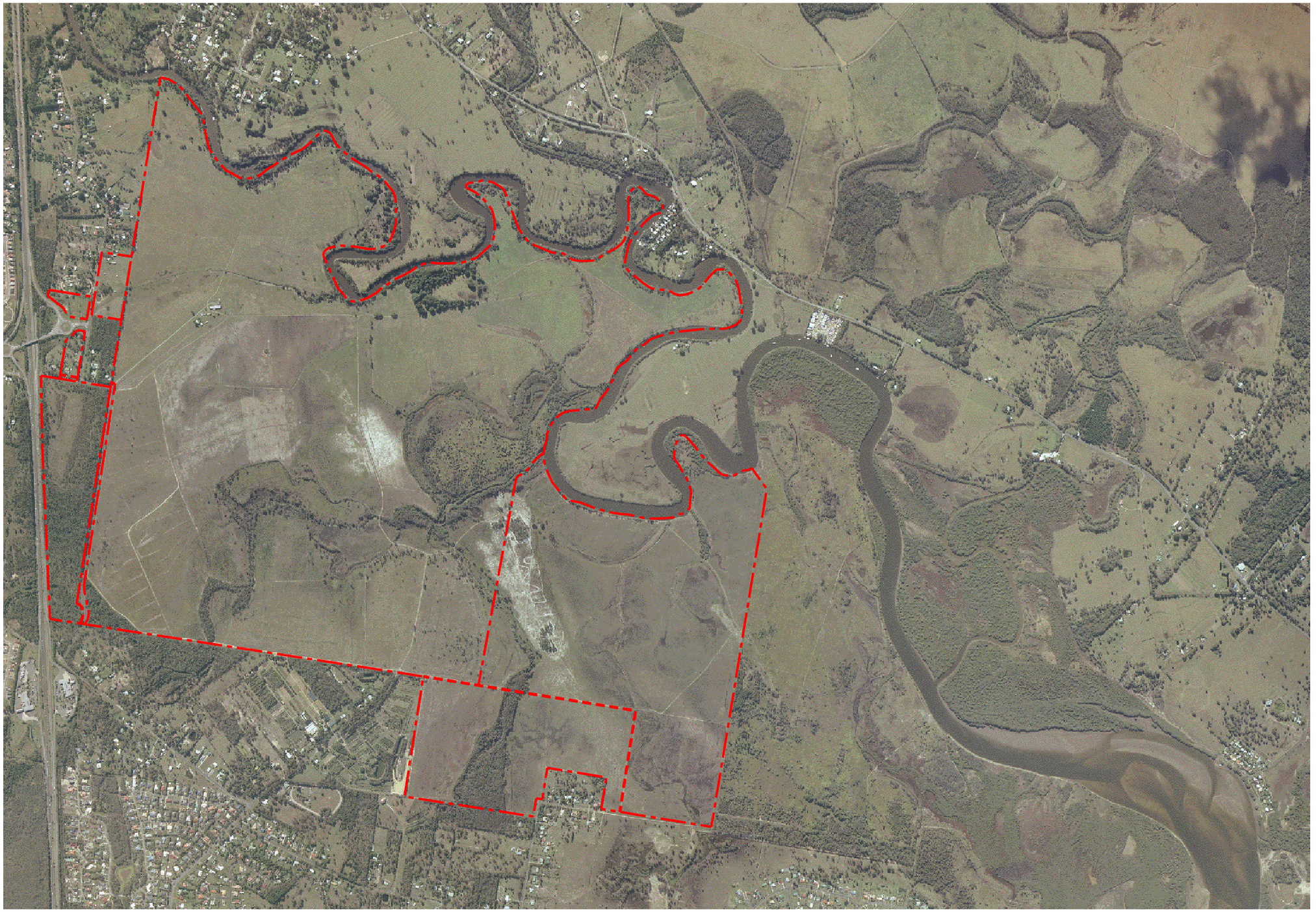
Rev: Orig. Date: November 2007

Project No.: 7800/40

Northeast Business Park Pty Ltd

CAD FILE: I:\7800-40\ACAD\NES Matters Report\Figure 1 - Locality Plan.dwg
XREF's: Caboolture_mga94

PRINT DATE: 23 November, 2007 - 7:12am



Date of Aerial Photograph - July 2007

LEGEND

Site Boundary

200 0 200 400 600 800 1000m
1:20,000

Scale 1:20,000 (A3)

FIGURE 2
AERIAL PHOTOGRAPH OF SITE

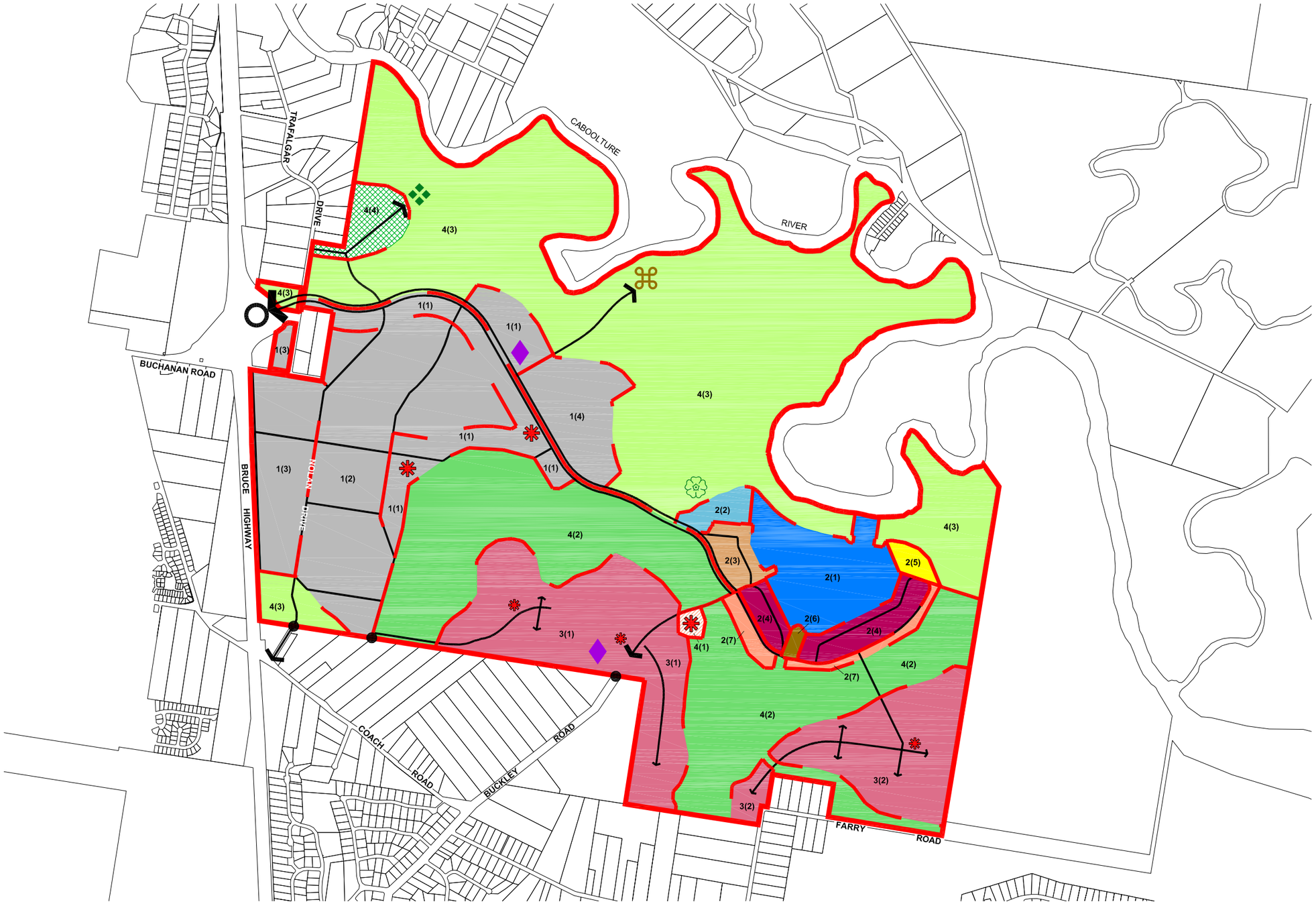
Rev: Orig. Date: November 2007

Project No.: 7800/40

Northeast Business Park Pty Ltd

CAD FILE: I:\7800-40\ACAD\NES Matters Report\Figure 2 - Aerial Photograph of Site.dwg
XREF's:

PRINT DATE: 23 November, 2007 - 7:13am



Plan sourced from PMM Brisbane Pty Ltd, Dwg name 20430STRUCTURE,
Plan Ref 20430-10F, 25 September 2007.

200 0 200 400 600 800 1000m
1:20,000

Scale 1:20,000 (A3)

FIGURE 3

NORTHEAST BUSINESS PARK STRUCTURE PLAN

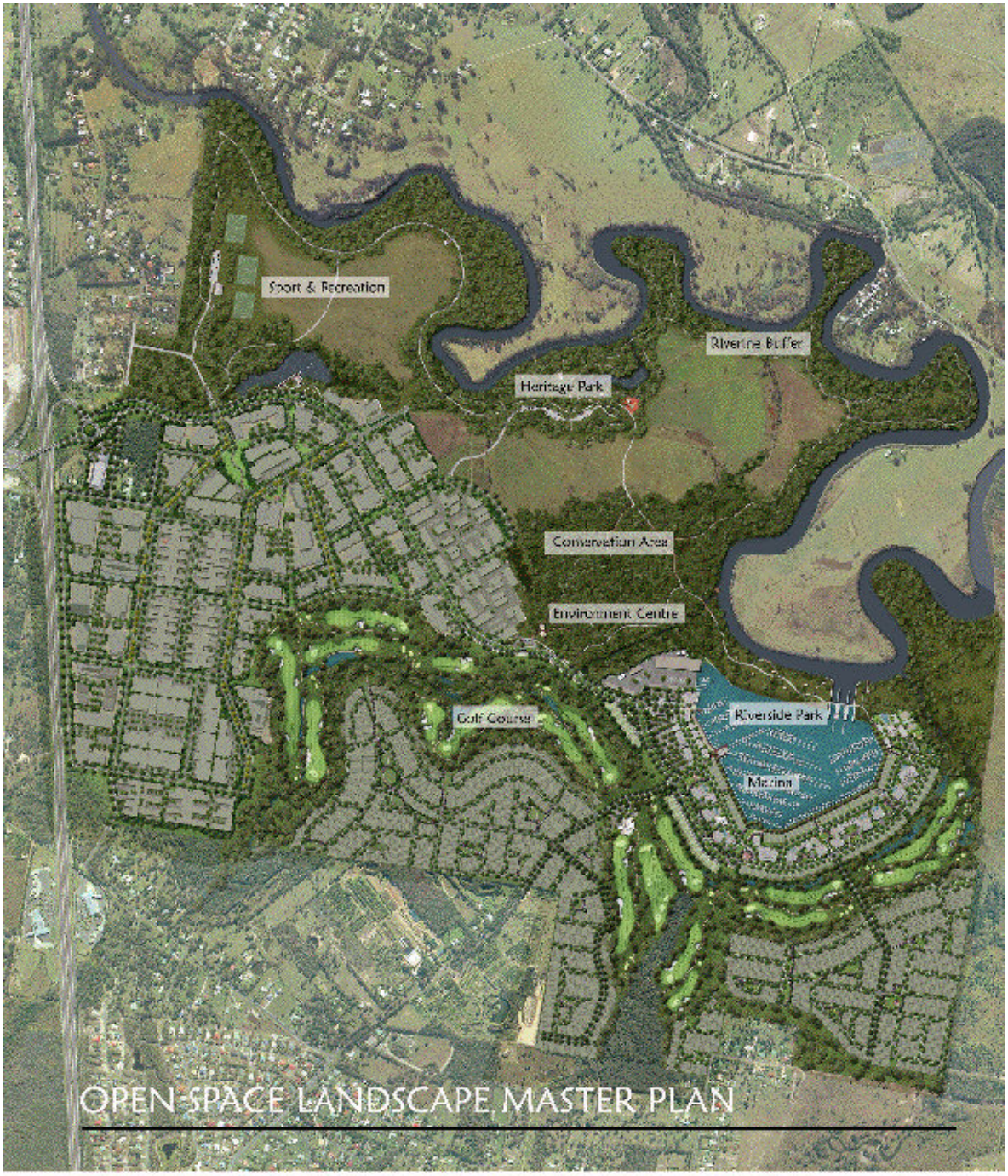
Rev: Orig. Date: 26 October 2007

Project No.: 7800/40

Northeast Business Park Pty Ltd

CAD FILE: I:\7800-40\ACAD\NES Matters Report\Figure 3 - Northeast Business Park Structure Plan.dwg
XREF's:

PRINT DATE: 23 November, 2007 - 7:14am



Graphic by v2i and Place Design Group

Not To Scale

FIGURE 4

NEBP LANDSCAPE VISUALISATION

Rev: Orig. Date: November 2007

Project No.: 7800/40

Northeast Business Park Pty Ltd

PRINT DATE: 23 November, 2007 - 7:14am

CAD FILE: I:\7800-40\ACAD\NES Matters Report\Figure 4 Northeast Business Park Landscape Visualisation.dwg
XREF's: Caboolture_mga94

1 Mixed marine vegetation
2 Paperbark (*Melaleuca quinquenervia*) open forest
3 Disturbed grassland
4 Cypress pine (*Callitris columellaris*) woodland
5 Disturbed Saltwater couch (*Sporobolus virginicus*) grassland
6 Swamp oak (*Casuarina glauca*) woodland
7 Disturbed mixed species woodland
8 Swampy heathland
9 Riparian vegetation
10 Cultivated Vegetation
11 Scribbly gum (*Eucalyptus racemosa*) shrubby open forest
12 Regenerating paperbark forest
13 Regenerating *Acacia* dominated woodland
* White-bellied Sea-eagle Nest

Areas of cut for flood mitigation purposes

LEGEND
STRUCTURE PLAN BOUNDARY
PRECINCT BOUNDARY
1 MIBA PRECINCTS
1(1) MIBA ESPLANADE
1(2) MIBA CORE
1(3) MIBA HIGHWAY
1(4) MIBA MARINE INDUSTRY
2 MARINA PRECINCTS
2(1) MARINA BASIN
2(2) SHIPYARD
2(3) MARINA VILLAGE
2(4) MARINA RESIDENTIAL
2(5) HOTEL
2(6) MARINA PAVILION
2(7) GOLF RESIDENTIAL
3 RESIDENTIAL PRECINCTS
3(1) RESIDENTIAL WEST
3(2) RESIDENTIAL EAST
4 OPEN SPACE PRECINCTS
4(1) GOLF CLUB
4(2) GOLF COURSE
4(3) OPEN SPACE
4(4) COMMUNITY MULTI USE
COMMUNITY NODE
HERITAGE PARK
SPORTING FIELDS
EDUCATION & TRAINING
ENVIRONMENT CENTRE
ARTERIAL
SUB ARTERIAL
COLLECTOR
POSSIBLE FUTURE PUBLIC TRANSPORT ROUTE
LOAD LIMITED THRESHOLD

Plan sourced from PMM Brisbane Pty Ltd, Dwg name 20430STRUCTURE,
Plan Ref 20430-10F, 25 September 2007.

200 0 200 400 600 800 1000m
1:20,000

Scale 1:20,000 (A3)

FIGURE 5
OVERLAY OF VEGETATION COMMUNITIES ON THE NORTHEAST BUSINESS PARK STRUCTURE PLAN

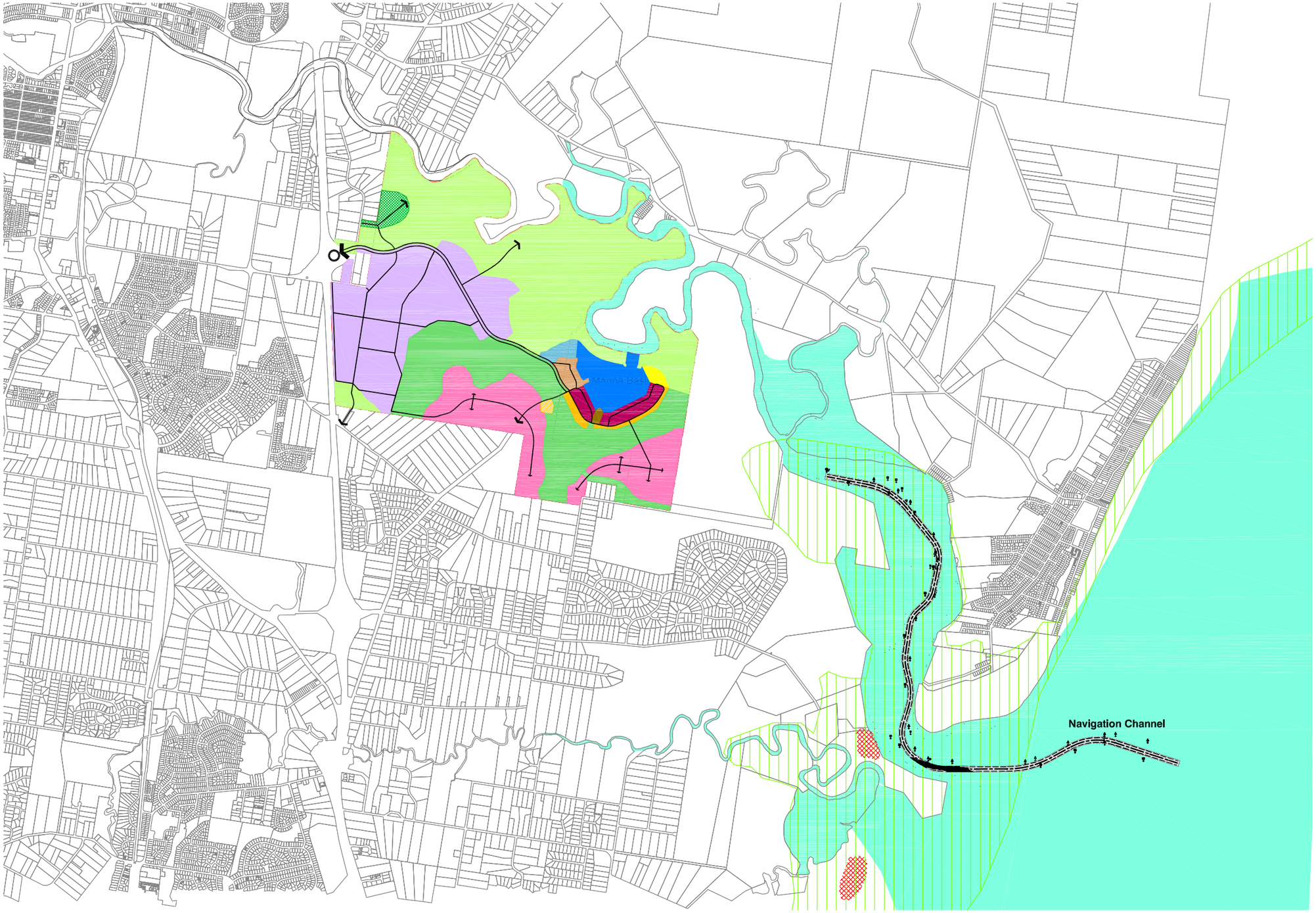
Rev: Orig. Date: November 2007

Project No.: 7800/40

Northeast Business Park Pty Ltd

CAD FILE: I:\7800-40\ACAD\NES Matters Report\Figure 5 - Overlay of Vegetation Communities on the NEBP Structure Plan.dwg
XREF's:

PRINT DATE: 23 November, 2007 - 7:15am



Map disclaimer: 2003 Regional Ecosystem Map, Date: 21.06-07. Regional ecosystem linework reproduced at scale greater than 1:100,000, except in designated areas, should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100,000 is +/-100 metres. Regional ecosystem mapping reproduced with permission of Environmental Protection Agency 2007.
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Rev: Orig. Date: November 2007

Northeast Business Park Pty Ltd

CAD FILE: I:\7800-40\ACAD\NES Matters Report\Figure 6 Matters of NES Map.dwg
XREF's: Caboolture_mga94; X-Base-Design 3

Scale 1:20,000 (A3)

FIGURE 6
MATTERS OF NATIONAL ENVRIONMENTAL SIGNIFICANCE MAP

Project No.: 7800/40

PRINT DATE: 23 November, 2007 - 7:15am

APPENDIX A

Moreton Bay Wetlands Profile

Moreton Bay Queensland - 41

1. Form compiled by:	Division of Environmental Planning, Environmental Protection Agency, PO Box 15155, CITY EAST, BRISBANE QLD 4002. Ph: (07) 3227 6938, Fax: (07)3227 7237
2. Sheet last modified:	June 1999
3. Country:	Australia
4. Name of Ramsar site:	Moreton Bay Queensland
5. Map of site included?	a) hard copy: b) digital (electronic) format:
6. Geographical coordinates:	Latitude: 27 20' South; Longitude: 153 10' East
7. General Location:	Immediately East and extending North-East and South-East of the City of Brisbane, the Capital of the State of Queensland.
8. Elevation:	Varying from sea level to 280 metres at Mt Tempest, Moreton Island.
9. Area:	113 314 ha
10. Overview:	Moreton Bay is a semi-enclosed basin bounded on its eastern side by two of the largest sand islands in the world. It is one of only three extensive intertidal areas of seagrass, mangroves and saltmarsh on the eastern coast of Australia that provide habitat for water birds.
11. Ramsar Criteria:	1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c,
12. Justification of criteria under point 11:	1b Moreton Bay is one of the largest estuarine bays in Australia which are enclosed by a barrier island of vegetated sand dunes. 1c Moreton Bay plays a substantial role in the natural functioning of a major coastal system through its protection from oceanic swells providing habitat for wetland development, receiving and channelling the flow of all rivers and creeks east of the Great Dividing Range from the McPherson Range in the south to the north of the D'Aguilar Range. 2a Moreton Bay supports appreciable numbers of the vulnerable green and hawksbill turtles, the endangered loggerhead turtle and is ranked among the top ten dugong habitats in Queensland. 2b Moreton Bay supports over 355 species of marine invertebrates, at least 43 species of shorebirds, 55 species of algae associated with mangroves, seven species of mangrove and seven species of seagrass. 2c It is a significant feeding ground for green turtles and is a feeding and breeding ground for dugong. The Bay also has the most significant concentration of young and mature loggerhead turtles in Australia. 3a Moreton Bay supports more than 50,000 wintering and staging shorebirds during the non-breeding season. 3b At least 43 species of shorebirds use intertidal habitats in the Bay, including 30 migratory species listed by JAMBA and CAMBA. 3c The Bay is particularly significant for the population of wintering Eastern curlews (3,000 to 5,000) and the Grey-tailed tattler (more than 10,000), both substantially m,ore than 1% of the known Flyway population.

13a. Biogeographic region:	South Eastern Queensland
13b. Biogeographic regionalisation scheme:	Environment Australia 2000. Revision of the Interim Biogeographic Regionalisation of Australia (IBRA) and the Development of Version 5.1. - Summary Report. Department of Environment and Heritage, Canberra.
14. Physical Features:	(a) Geology and Geomorphology: Moreton Bay is one of the largest estuarine bays in Australia which are enclosed by barrier island of vegetative sand dunes. Moreton Bay is about 80 km long, 35 km wide in the north, tapering to less than 5 km in the south. Only near Moreton Island does water depth exceed 40 m. Moreton Bay is situated close to the southernmost limit of reef-building corals. These occur around Peel, St Helena, and Green Islands, and from Wellington Point to Raby Bay (Hekel et al, 1978). The mountains lying west of the coastal plains from south of Sydney to Fraser Island are formed chiefly by Mesozoic and Permian sedimentary rocks and granites. The eastern side of the range is and has been characterised by heavy rainfall and rapidly flowing rivers and creeks. A very large amount of detrital material is moved by these rivers to the sea, where strong longshore currents move the sediments, mainly quartz sand, northward. This process has continued all through the Quaternary to the present day (Benussi, 1975). Along the mainland shore, the Bay is bordered by extensive estuarine flats formed by coastal progradation during high sea levels of the Quaternary period of geologic time (approximately the last two million years)(Hekel et al 1978). The coastline south of Fraser Island is characterised by sandy beaches alternating with rocky headlands. Because of these features, the movement of sand is not uniform but intermittent. The sand accumulates south of rocky headlands or river mouths, building up the beach and moving the shoreline eastward. Especially during seasonal summer storms, sand moves around obstacles towards the north (Benussi, 1975). (b) Origins: Recent sediments are composed of two types: A. Oceanic quartz sand giving rise to immense tidal deltas consisting of sand banks: B. River sands and muds confined to the western side of the Bay. Unconsolidated Cainozoic sediments dominate, however rocks are exposed at Point Lookout, at Dunwich, and at the south-west of North Stradbroke Island near Canaipa Passage. The stratigraphic and geomorphic succession of North Stradbroke Island (Laycock, 1975) is as follows: Mangrove muds (organic silt), freshwater swamps - in process of formation. Beach, beach ridges, and sand dunes, without vegetative cover - in process of formation. Cainozoic Beach ridges, stabilised by vegetative cover post - Recent emergence. Sand dunes, stabilised by vegetative cover - post-Recent emergence. Freshwater swamps in coastal regions - post-Recent emergence. Sand dunes, stabilised by vegetative cover [pre-Recent emergence. Mesozoic Sandstone and conglomerate Rhyolite and rhyolitic tuff Palaeozoic Greenstone. Fringing coral reefs have formed around islands in the centre of the Bay. Notable coral reef areas include Peel Island, Goat Island, One Mile, the Rainbow Channel and a small reef off the south-west tip of Moreton Island.

Coastal headlands and most of the Bay islands of Moreton Bay are formed of Tertiary age basalts and freshwater shales, Mesozoic age sandstones, and Palaeozoic age metamorphic rocks with laterite soils developed at the surface. In the Quaternary, the major influence on sedimentation was sizeable fluctuations (up to 150 m) in sea level. This resulted from changing volumes of the oceans when water was transferred between the ocean, and glaciers and ice sheets. Moreton Bay was filled and drained several times in response to these distant glacial cycles. During low sea level phases the bed of the Bay was exposed. Sediments dried out, weathered, and soils developed. Rivers flowed across the emerged Bay to the ocean shore which, at times of extreme low sea level, coincided with the edge of the continental shelf. As the rivers crossed the Bay they incised river valleys and transported sediment to the ocean. At times of rising sea level, the coastline moved westwards, the former river valleys were back filled with river gravels and subsequently estuarine mud and then with marine sand and mud. Moreton and Stradbroke Islands are drowned sand dune island barriers anchored by rocky headlands. They formed by wave and wind action during several cycles of sea level change. The stages of dune development are marked by characteristic soil profiles (Hekel et al, 1978). Four sedimentation zones are present in the Bay under present conditions: * Nearshore zone of active sediment accumulation: This is the tidal flat environment where sand and muddy sand is deposited, and coral reef develops. * Quiescent basin sedimentation: Depressions in the drowned former land surface have been filled by marine mud. The Brisbane, Pine, and Caboolture Rivers have been the main suppliers of sediment, which rarely exceeds 10 m in thickness in this zone. * Zone of minimal deposition: Little sediment is supplied to this zone because of its distance from the source of sediment. In addition, any mud that does reach this zone tends to be kept in suspension by tidal currents thus preventing significant deposition. The older sediments remain exposed at the sea floor or are covered by only a thin layer of muddy sand. * Tidal delta depositional zone: Much of the longshore drifting sand of the ocean beaches of Moreton and Stradbroke Islands is trapped in tidal deltas which have formed at the Southern, South Passage and Northern entrances to Moreton Bay. (c) Climate: Being situated on a biogeographical boundary separating the tropical from the more temperate areas the climate of the bay is sub-tropical. Annual average rainfall is 113.5 cm. This occurs predominantly in summer during the months of October to April. Average annual temperatures for Brisbane are a maximum of 30 degrees C and a minimum of 18 degrees C. The site is subject to the effects of tropical cyclones which originate in the Coral Sea and may travel as far south as Moreton Bay before usually weakening into a low or rain depression as they cross the coast. Most of the rainfall from these lows usually falls in the catchment areas of the major rivers flowing into Moreton Bay and considerable silt, mud and sand is washed down into the bay when these rivers flood. From 1840 to 1893 there were eight major floods in the Brisbane River. The latest occurred in 1974 (Saunders, 1975). (d) Hydrology: On the large sand

islands of Moreton and North Stradbroke rainfall filters through the sand dunes to emerge in lakes and swamps and thence into Moreton Bay and the Pacific Ocean. On North Stradbroke Islands some of this fresh water is extracted by the Local Authority for domestic use. Increased urbanisation of the central bay islands and the adjacent mainland may result in increased demands for water extraction from North Stradbroke Island. Increases in waste discharges and runoff into the bay may also occur. The bay receives most of the sewage and industrial effluent of the wider Caloundra-Brisbane-Gold Coast metropolitan areas as well as the storm water runoff containing sediment, fertilisers, pesticides and other pollutants from the urban and rural areas. These areas comprise the catchments of several large rivers and smaller creeks rising in the Lamington Plateau in the south, north along the Great Dividing Range to the D'Aguilar Range. These rivers are: Nerang; Pimpama; Coomera; Albert, Logan; Brisbane: Bremer: Pine: and Caboolture Rivers (Laycock, 1975). The hydrodynamic nature of Moreton Bay is determined by interaction of the semi-diurnal tide, propagating mainly through the northern entrance, with the depth variations inside the bay. The tidal range inside the bay is about 20% greater than outside the bay. The patterns of the tide-height contours and the tidal currents in the bay are strongly influenced by the depth-topography of the bay. The tidal currents vary from 0.2 ms-' in the shallow western region to 1.0 ms-1 in the deep channels to the north-east. The salinity of Moreton Bay is higher on the eastern side because freshwater flows into the western side. Therefore the spatial and temporal distribution of salinity in the bay depends on the varying rainfall in the catchment of the rivers flowing into it. Higher temperatures in summer and lower temperatures in winter are recorded in the shallow western bay compared with the north-eastern area of the bay and near South Passage due to the moderating influence of the Pacific Ocean on the latter areas. Surges due to cyclones off the Queensland coast occur in Moreton Bay while severe local storms can cause transient changes in the water level of the bay. (Harding, 1979). (e) Water quality: Depending on water depths and circulation patterns, the Bay has a limited capacity to assimilate the large quantity of waste it receives. A draft environmental policy on water seeks to grade all Queensland waters into one of four water quality classes, Q1 to Q4. The intention is for all the waters of Moreton Bay, except near waste discharges, to ultimately meet at least Q2 standard, defined as the maintenance of a high water quality with the only discharges to be permitted being those which, at the worst, result in minor changes to the biological community. (f) Water depth fluctuations and permanence: Moreton Bay has experienced several sea level oscillations over the past 500,000 years and tides are semi-diurnal with an amplitude of more than 2 metres.

15. Catchment Area:

16. Hydrological Values: The two principal rivers entering the bay are the Brisbane and Logan Rivers which have an average annual discharge of 1 215 000 Ml and

810 000 M1 respectively. These are joined by tributaries from the southern slopes of the Brisbane Range, from the Great Dividing Range and from the southern eastern and western slopes of the D'Aguilar Range. The Logan and Albert Rivers extend from the northern slopes of the McPherson Range across the lowlands in the southern part of the region. The rivers are tidal for most of their course across the lowlands. Moreton Bay consists of a deeper eastern section subject to strong north-south tidal circulation and a shallower western section with much weaker east-west mixing. Consequently, fine particles settle in the less turbulent western areas of the Bay while the eastern Bay is characterised by sandy sediments associated with higher tidal velocities. This maintains an ecological gradient based on particle size ensuring high levels of biodiversity.

17. Wetland Type: A, B, C, D, E, F, G, H, I, J, L, M, O, Q, Tp, Ts, W, Xf, Xp, 9

18. Ecological Features: The Moreton Bay region is an important habitat for many species of birds and is one of only four recognised sites of significance to wintering migratory wading birds along the eastern Australian coast (Thompson and Kikkawa, 1988). Australia is a signatory to the Japan-Australia (JAMBA) and China-Australia (CAMBA) migratory bird agreements which require the habitats used by certain species listed in the agreements to be set aside as reserves. At least 34 listed species have been recorded from Moreton Bay including the eastern curlew (Numenius madagascariensis); eastern whipbird (Psophodes olivaceus); bar-tailed godwit (Limosa lapponica); grey-tailed tattler (Heteroscelus brevipes); ruddy turnstone (Arenaria interpres); red-necked stint (Calidris ruficollis); sanderling (Calidris alba); curlew sandpiper (Calidris ferruginea) and common sandpiper (Actitis hypoleucos) (Thompson and Kikkawa, 1988). At least 254 species of bird have been recorded from North Stradbroke Island including Gould's petrel (Pterodroma leucoptera), the arctic tern (Sterna paradisaea) and the long-tailed jaeger (Stercorarius longicaudus) (Vernon and Martin. 1975). Image analysis of all intertidal areas in Moreton Bay, including Pumicestone Passage estimated that a total of 23,000 ha of tidal flats are exposed at low water datum characterised by marked differences in substrate type and species of waders present (Thompson, 1990b). Four types of roosts and four habitats have been determined for waders in Moreton Bay (Thompson, 1991 Appendix 1) using particle size analysis. The main habitats were:

- muddy intertidal, often with seagrass;
- muddy intertidal with no seagrass, usually associated with sewage outlets;
- sandy;
- coral.

High amounts of silt were found at very muddy sites associated with slow currents. High amounts of fine sand occurred at very sandy sites with fast currents. The amount of fine sand and very fine sand in the substrate reflected estuarine conditions at a site. High percentages of fine sand were recorded at oceanic influenced sites where fast currents and limited riverine sediment deposition led to large average particle

sizes. Sites with very fine sand are associated with muddy riverine conditions due to slower currents and the contribution of fine particles from nearby rivers. A relationship was shown to exist between the location of those habitat sites with high species numbers and the location of roosts. Species of waders present differed significantly among the four habitats. The ruddy turnstone was found to be a key indicator species of the coral habitat strewn with coral rubble giving the surface considerable topographic relief. The bar-tailed godwit characterised the other extreme distinguished by sandy sites with a lush covering of seagrass (Thompson,1990 a, 1991). A total of 19 plant formations occur on the tidal wetlands. Six of those formations are dominated by the grey mangrove (Avicennia marina). Climatic conditions in Moreton Bay provide optimum temperatures of 18-24 degrees for the growth of Avicennia marina for six to seven months of the year. Behind the fringing mangroves, salt-marsh is usually zoned parallel to the shoreline and consists of three plant communities broadly classified as:

- shrublands, the dominant species being Sarcocornia spp. and seablite (Suaeda australis);
- sedge (Juncus krausii) and rush swamps;
- grasslands (sand couch (Sporobolus virginicus)) as well as bare salt pans.

Seven species of mangroves are found in Moreton Bay and major areas of mangroves are located throughout the Bay and in particular along the Pimpama River, Coomera River, North Arm and the wetlands and waterways of McCoys Creek and Woogoompah Creek. Mangroves are the nursery areas and ultimate source of food for many commercial and recreational fish species and are necessary for the prevention of erosion, the provision of habitat, landscape value and to provide roosting areas for wildlife (Arthington and Hegerl, 1988). Four main types of shore bird roosts are identifiable in Moreton Bay (Thompson, 1991):

- open sandy island or beach: found mainly on Moreton and North Stradbroke Islands with only two similar roosts known on, or adjacent to, the western side of Moreton Bay. These types of roosts are used by most species;
- salt and clay pan: scattered within and behind the mangrove fringe. Birds may find cover under mangrove trees or shelter within clumps of samphire and sedge. These roosts are also used by most species;
- inland freshwater marshes: restricted to the western side of the bay and used by species such as the sharp-tailed sandpiper, greenshank and the black-winged stilt at all stages of the tidal cycle;
- mangroves: this is the preferred roosting situation of the grey-tailed tattler which roost standing on the branches of the mangrove trees. The whimbrel, eastern curlew, sandpiper, terek sandpiper and the greenshank may also roost in this situation;

Saltmarsh and saltpan areas are integral with and generally adjacent to mangrove areas. Apart from providing valuable feeding and crucial roosting areas for waders (Thompson and Kikkawa, 1989), these areas also represent buffers for the mangroves and function as a source of

material for detrital food chains. North and South Stradbroke Islands are barrier islands feeding sand sediments from ancient dune deposits into the eastern part of Moreton Bay (Maxwell, 1970). The two islands are separated by an opening nearly 2 kilometres wide at Jumpinpin; this bar and the Southport Bar at the southern end of South Stradbroke Island are fairly unstable and do not allow a seagrass population to establish. At the northern end of North Stradbroke Island a different situation occurs. Here the orientation of this island and Moreton Island allow for large sheltered sand banks flushed twice daily by oceanic water. From Amity Point to the northern end of Canaipa Passage shallow sand and muddy sand flats with protection from prevailing winds and strong currents make a good habitat for seagrasses. At South Passage sand has formed a fan-shaped bank known as Amity Banks. Further south the sand becomes muddier with clay and silt from the mainland and low offshore islands. Between Canaipa Passage and the Southport Bay at the southern end of South Stradbroke Island a series of low, small islands form the deltaic complexes of the Logan, Albert, Coomera and Pimpama Rivers. Between these islands are shallow mud flats and deeper channels. These areas, protected on one side by Stradbroke Island and on the other by the mainland or offshore islands, offer excellent habitats for seagrasses (Kirkman, 1975). Intertidal and shallow waters support seven species of seagrass which occur over an area of 6522 ha. This provides food and habitat for turtles, dugong, commercially and recreationally important fish and invertebrate populations in the bay. Research indicates that seagrass meadows are particularly vulnerable to disturbance by humans and are very slow to recover (Poiner, 1989). South Passage and the Rous Channel plus the sand banks of the bay, particularly the Moreton and Amity Banks area, represent an internationally significant habitat for dugong (Dugong dugon). Population estimates of at least 600 have been made for this species, a high number considering the proximity of their habitat to a major city such as Brisbane (Preen et al, 1989). Dugong feed mainly on seagrass and their survival is closely linked to the protection of these seagrass communities. Three species of turtle inhabit Moreton Bay year round. Hawksbill turtles (Eretmochelys imbricata) occur only occasionally while loggerhead turtles (Caretta caretta) occur in their thousands and feed on molluscs, crabs and sponges (Bustard, 1972). Moreton Bay is also a significant site for feeding green turtles (Chelonia mydas) (Limpus,C in press). Seagrass is a significant feature and likely to have influenced feeding behaviour and distribution of shore birds. Seagrass coverage is highest in those sites around Moreton Island and North Stradbroke Island where clean oceanic waters promote high rates of photosynthesis. Seagrass coverage is reduced in the muddy waters along the mainland of Moreton Bay and in sites with coral substrate. The sewage affected sites in Bramble Bay are entirely devoid of seagrass, as are a few sites in Pumice stone Passage and Southern Moreton (Thompson, 1991). Driscoll (1991), found that the substrate and conditions in Pumicestone Passage were not uniform throughout and that different locations had variations in the numbers of wader species present. Most species

showed a preference for particular locations but great knots (Calidris tenuirostris) and curlew sandpipers were not as consistent and habitat links for these species were hard to define. The differences related to: the pattern of substrate deposition; the extent of feeding areas; and the peculiarities of the tidal range in the Passage. One third of all waders counted were bar-tailed godwits but data from Thompson (1990c) suggests that the numbers of this species present in the Passage decrease in autumn. Conversely the number of grey-tailed tattlers was found to be higher in autumn and this was reflected in data from the Great Sandy Strait further north (Driscoll 1990). It is possible that the numbers of grey-tailed tattlers present in south-east Queensland increase during their northward migration.

19. Noteworthy Flora: Species dependent on mangrove estuarine areas comprise up to 67% of the entire commercial catch of fisheries in eastern Australia. Mangroves form a fringe around much of the shoreline of Moreton Bay. Seven species have been identified but only three are considered abundant - grey mangrove (Avicennia marina), river mangrove (Aegiceras corniculata), yellow mangrove (Ceriops tagal). Other species of mangrove include red mangrove (Rhizophora stylosa), milky (or white) mangrove (Excoecaria agallocha) and large-fuited orange mangrove (Bruguiera gymnorhiza). Fifty-five species of algae are associated with mangroves in the bay and 2000 ha of salt marsh vegetation have been identified. Saltmarsh includes samphires, sedges, salt couch, bare saltflats and stunted mangroves. Important saltmarsh species include seablite (Suaeda australis), beadweed (Salicornia quinquelflora). Threatened communities consisting of wallum woodland (swamp paperbark (Melaleuca quinquenervia)) grow in saturated areas close to the shores of Moreton Bay. The high diversity of marine plants include seven species of seagrass belonging to five different communities. Species are: eelgrass (Zostera capricorni), Halodule uninervis, Syringodium isoetifolium, Halophila ovalis, Halophila spinulosa, Cymodocea serrulata, Halophila dicipiens. Seagrasses have been shown to be important in the life history stages of commercially important fishes and crustaceans(Hyland. 1988,1989) dugongs, turtles, swans, waders, fishes feed in or on seagrasses; seagrass-; allows long-billed waders (e.g. bar-tailed godwit) to penetrate deeply into the substrate; seagrasses provide important settlement areas for the post-larval stage of penaeid prawns.

20. Noteworthy Fauna: With the combination of muddy habitats (western side), sandy habitats (eastern side), coral and seagrass habitats, Moreton Bay is extremely important as a site for shorebird species (Thompson 1991). At least 43 species of wading birds use intertidal habitats in the bay, including 30 migratory species listed by JAMBA and CAMBA. More than 50 000 wintering and staging waders depend on Moreton Bay during the non-breeding season(Thompson, 1990b). The bay is particularly significant for the Eastern curlews Numenius madagascariensis (3000 to 5000 birds) and the grey-tailed tattler Tringa brevepes (> 10 000 birds) in winter. This diversity of habitats and species utilising the area indicates the importance of both sides of the bay when considering

conservation measures. Moreton Bay also has particularly large populations of cormorants and terns, white herons, spoonbills, ibises and egrets. The bay is ranked among the top ten dugong habitats in Australia and together with the Gulf of Carpentaria and Torres Strait is considered one of the most important areas for dugong in Queensland. Herds of dugong of up to 104 individuals have been observed. Three species of sea turtles inhabit Moreton Bay in significant numbers. Of these species, the hawksbill and green turtles are considered to be endangered and the loggerhead is regarded as threatened in a world context. However within Australia the loggerhead is listed as an endangered species while the green and hawksbill turtles are listed as vulnerable. Feeding green turtles are found in Princess Charlotte Bay, Moreton Bay, Shoalwater Bay, Hervey Bay and Repulse Bay. Of these locations, Moreton Bay has the largest concentration of feeding green turtles in Australia. Tagging studies have shown that the green turtles resident in Moreton Bay migrate to the southern Great Barrier Reef (Lady Musgrave, Heron, Wreck and North West Islands) and the northern Great Barrier Reef (Raine Island) to breed. Major concentrations of loggerhead turtles are found in Moreton and Hervey Bays and the southern part of the Great Barrier Reef. Significant numbers of young and mature loggerhead turtles inhabit Moreton Bay. This is the most significant concentration of loggerheads in Australia (C. Limpus in press). A total of 175 species of fish are listed for Flinders Reef off Cape Moreton and at least 100 species occur inside the bay. In excess of 80 species of echinoderms have been recorded from Moreton Bay and adjacent reefs. One study identified 355 invertebrate species from 400 subtidal sites within the bay. Chestnut teal and Pied oystercatchers breed on the shores of the bay and Fruit bats roost in mangroves during the day. An increasing number of humpback whales enter the bay each year as they migrate past, these animals ceased entering Moreton Bay when a whaling station operated on Moreton Bay at Tangalooma from 1952 to 1962. Nine species of birds are dependent on mangrove vegetation. Many first year-birds of migratory species remain in the bay during the breeding season (Southern hemisphere winter) when the number of migratory species present in the bay increases as they move northwards with the onset of winter. Large populations of resident birds depend on the fringing wetlands and large populations of marine birds feed in the open waters of the bay. Moreton Bay provides significant habitat for the water mouse (false water rat) Xeromys myoides which is listed as Vulnerable in EPBC and NCA.

21. Social and Cultural Values:

Some of the rest remaining evidence of Aboriginal adaptation to a marine-based resource is to be found on Moreton Island. Other sites of significant Aboriginal cultural heritage are located on Bribie, North Stradbroke, Peel, St Helena, Macleay, Lamb, Karragarra and Russell Islands as well as Toorbul Point, Caboolture River and Victoria Point. Types of sites include middens, fish traps, artefact scatters, quarries and scarred trees. The shoreline of Moreton Bay was the first area in the Brisbane region to be settled by Europeans. Coochie Mudlo Island

was the site of the first landing by Matthew Flinders during his exploration of Moreton Bay and the Brisbane River. St Helena Island which was used as a prison and quarantine station at different periods was the first historical area in Queensland to be reserved as a National Park solely because of its historic ruins. Other areas settled by Europeans include Peel Island, used first as a quarantine station and then as a leper colony, Dunwich and Amity Point on North Stradbroke Island and Redcliffe on the mainland which was the site initially chosen for the penal colony before it was moved up the Brisbane River to the site now occupied by the business centre of Brisbane.

22. Land tenure/ownership:

(a) Site: Moreton Bay lies within Queensland waters. Most of the land fronting the bay consists of land under the control of the Government of the State of Queensland, but there are substantial areas of privately owned land along the western shore. A number of canal estates have access to the bay and some of the privately held land is also proposed for canal estates. (b) Surrounding area: This incorporates and on the mainland a greater proportion of privately owned land and commercial forests.

23. Current land use:

Fishing and collecting: The Moreton Bay region supports one of the most productive fisheries in Queensland, representing just under three percent of the Queensland coastline while annually producing about 20 percent of Queensland's commercial seafood catch by weight (Williams, 1991). The Bay is also a popular recreational fishing area. A variety of species is targeted, including yellowfin bream, whiting, tailor, flathead, black bream, mackerel, snapper and mullet. Eight species of prawn and four species of crab are commercially important, with mud and blue swimmer crabs also being of recreational importance. Commercial collection of fish, invertebrates, anemones and live corals for aquarium purposes occurs within the Bay and the offshore reefs while bait collection, food gathering and viewing of coral and aquarium fish species are popular recreational pursuits. Commercial oyster banks operated by licensed oyster growers, commercial baitworm and shell collection also occurs. During 1986, expenditure on commercial and recreational fishing activities was estimated at more than $100 million, while the retail value of the commercial fishing haul has been estimated at $100 million (McDonald and others, 1989). Recreation and tourism: The Bay is a major area for recreational boating and water related activities offering opportunities for a wide range of water-based recreation including fishing, sailing, power boating, water skiing, parasailing, jetskiing, sailboarding, scuba diving, bird watching, marine study and snorkelling. The southern area of the bay receives the heaviest boating use for most activities because of its sheltered waters and proximity to many boat launching facilities. The three barrier islands (Moreton, North and South Stradbroke) have unspoilt beaches, topographic diversity within the dunal system and largely undisturbed natural scenery, forest and wetlands . Port facilities: The Port of Brisbane is the fastest growing capital city port on the east coast (POBA, 1990), and is expanding its capabilities to handle a wide variety of cargoes.

The Moreton Bay Strategic Plan seeks to integrate the operation and development of shipping channels and other areas of port expansion with the natural environment. Sand mining and extraction: Silica and heavy mineral sands are extracted primarily from North Stradbroke Island. Silica deposits used include the northern bay banks, Middle Banks and Rous Channel. These sources are highly valued in a regional sense due to the diminishing resources available from mainland streams and terrestrial areas. Rutile and zircon exist in offshore deposits for which exploration leases are being considered. Water extraction: Redland Shire Council's mainland water supply is supplemented by water extracted from an unconfined aquifer on North Stradbroke Island. Education and research: The bay is an important environmental and historical education resource for primary, secondary and tertiary education due to its range of undisturbed ecosystems. The University of Queensland has a field station at Dunwich. CSIRO has research facilities at Cleveland. The Department of Primary Industries has research facilities at Deception Bay and Bribie Island. The Environmental Protection Agency has research facilities on South Stradbroke Island and educational facilities on St Helena and Moreton Islands. The Department of Education runs environmental education centres at Nudgee Beach, Darling Point and Jacobs Well for educating children on coastal and environmental matters The mangrove boardwalk at Wynnum North is also a significant educational resource. Transport: Several of the Bay's marinas and harbours provide bases for the transport operations which service surrounding locations and the bay islands, servicing commercial, recreational and residential demands.

24. Factors adversely affecting ecological character (past, present, potential):

Past/present: Land reclamation and soil dumping or urban and industrial development and shipping and port activities are occurring at various sites in the Bay. Up to 150 000 m3 of sand per annum are extracted from the Bay for use in the building, foundry and manufacturing purposes. Most pressure from human activities is being exerted on the western shoreline, which also attracts large numbers of wader species that favour muddy habitats. A series of localised problems such as the occasional 'red tides' at Bramble Bay (Moss et al, 1989) have occurred due to a combination of concentrations of phosphorus and nitrogen higher than background levels combined with large quantities of treated industrial and domestic waste waters and contaminated storm water runoff. Such affects are to be reduced by minimising waste inputs from direct discharges and treating contaminated runoff.

Potential: No information

25. Conservation measures taken:

Conservation Measures: Legislative protection: National Parks in the Moreton Bay region and managed by the Queensland Parks and Wildlife Service of the Environmental Protection Agency are: Blue Lake NP on North Stradbroke Island, Bribie Island NP, Moreton Island NP. St Helena Island NP. Conservation Parks administered by the Queensland Parks and Wildlife Service, but which may have the

	Local Government as trustee are: Beachmere CP on the western mainland side of the Bay, Bird Island CP, Buckleys Hole CP, Cobby Cobby Island CP, Coomera Island CP, Goat Island CP, Kangaroo Island CP, King Island CP, MyoraCP (North Stradbroke Island), South Stradbroke Island Conservation Park 1, South Stradbroke Island Conservation Park 2, Woogoompah Island CP. Fish Habitat Areas administered by the Department of Primary Industries, cover approximately 15.3% of the Bay. Management plans for the National Parks referred to above as well as National Parks in the catchment area have or are currently being prepared. Moreton Bay has been declared a Marine Park and a Strategic Plan has been prepared with the goal "to provide for economically sustainable use of Moreton Bay and for protection of its natural, recreation, cultural heritage and amenity values" . The Marine Park Zoning Plan has been approved as subordinate legislation under the Marine Parks Act 1982, and forms the basis of management of most of the site. Conservation Measures Proposed: Because of the complex pattern of shore bird distribution in Moreton Bay some species that are common on the western shores of Moreton Bay, such as the terek sandpiper, lesser golden plover, sharp-tailed sandpiper, black-tailed godwit and the marsh sandpiper, are seldom seen in the eastern sector of the bay. Therefore conservation measures need to deal with both sides of the bay to ensure sufficient habitat for all waders (Thompson, 1991) Shorebird Management Plans are currently being developed. Further areas of North Stradbroke Island are proposed as National Park. Treatment of domestic effluent discharge has been upgraded to secondary level with tertiary level contemplated for the future. Use of Personal Water Craft (jet skis) have been controlled within the Moreton Bay Marine Park with being banned from buffer and protection zones and restictions to navigation channels in conservation zones and in speed in other zones. (PWC use in MBMP. EPA 2003) (Collins, P and Jessop, R et al 2000). Artificial wetlands constructed in recent years have proved successful with the Empire Point Roost site recording counts in excess of 1,000 birds and Kakadu Beach over 2,000 birds The State Coastal Management Plan - Queensland Coastal Policy (August 2001) provides policy that prevents, minimises or mitigates further loss or degradation and impacts on coastal wetlands.
26. Conservation measures proposed:	Construction of an enhancement to the Toorbul roost site is in the planning stage in October 2004. Queensland Parks and Wildlife Service (Moreton Bay Marine Park section) have produced (Oct 2004) a final draft of the Shorebird Management Strategy - Moreton Bay. The Port of Brisbane, Environmental Protection Agency/ QPWS and Queensland Wader Study Group are working to design a 12ha artificial roost site on land set aside by the PoB, and to be constructed by the PoB, to accommodate the PoB site's 13,000 birds (Jan 2003), this is approximately 25-30% of Moreton Bay's waders.
27. Current scientific research and facilities:	Queensland University, CSIRO and Department of Primary Industries have research stations in the Moreton Bay region. Other universities

	and colleges use Moreton Bay for research and education. Projects are underway for tracking certain species (e.g. eastern curlew) . The Environmental Protection Agency is researching the population dynamics of loggerhead turtles within Moreton Bay. The Queensland Wader Study Group monitor dozens of wader roost sites on a monthly basis throughout Moreton Bay and this data provides government and private decision processses with current and historic data. Monitoring roosting birds on the artificial Empire Point and Kakadu Beach sites. Preparation of plans for an artficially enhanced natural roost site at Toorbul.
28. Current conservation education:	University of Queensland's research station on North Stradbroke Island is regularly used by High School groups. QPWS interpretation facilities are available on Moreton Island and St Helena Islands. Interpretative signage for shorebirds, historic features, marine species etc erected along shorelines by local governments in partnership with special interest groups. Public educational workshops/lectures/field trips conducted by special interest groups and government agencies. Boondall Wetlands Information Centre (funded by the Brisbane City Council) is staffed 7 days/week and provides wetland interpretation by trained staff.
29. Current recreation and tourism:	An estimated 300 000 recreational fishers spend 1.5 person days each in Moreton Bay. An estimated 2000 people visit Brisbane each year specifically to watch waders in Moreton Bay (RAOU data). Other activities include yachting, water skiing, sail boarding, jetsking, scuba diving, picnicking, 4wd on island beaches, camping and boating. Bay islands attract large numbers of tourists, particularly Morerton Is and Stradbroke Is. Whale watching is now an established and growing tourism venture based o the increasing humpbacked whale populaions migrating past Moreton Bay. (Orams & Forest)
30. Jurisdiction & 31. Management authority:	Jurisdiction: National Parks, Environmental Protection Agency (Queensland Parks and Wildlife Service), Conservation Parks , Environmental Protection Agency (Queensland Parks and Wildlife Service) and Local Governments where they are the trustees, Coastal Protection Environmental Protection Agency, Monitoring environment, Environmental Protection Agency, Fish Habitat Areas, Department of Primary Industries, Unallocated Crown Land, Department of Natural Resources and Mines, Local Government Reserves, Local Governments .Management: Environmental Protection Agency (Queensland Parks and Wildlife Service). Local Governments for areas under their jurisdiction (Caloundra City Council, Caboolture City Council, Pine Rivers City Council, Redcliffe City Council, Brisbane city Council, Redlands City Council, Logan City Council, Gold City Council).
32. Bibliographical references:	Arthington, A.H. (1984); Bensink, A.H.A.& Burton, H.(1975); Benussi, G. (1975); Bucher, D. & Saenger, P.(1989); Davie, J.D.S.

(1984); Dowling, R.M. (1979); Durbidge, E.(1975); Durrington, L.R.(1977); Flood, P.G.(1984); Flood, P.G. & Grant, B.P.(19984); Harding, P.(1979): Hekel, Het al.(1979); James, P.M. (1984); Kelley, R.A. & Baker, J.(1984); Kirkman, H.(1975); Lane,B.A.& Parish, D.(1991); Laycock, J.W.(1975); McDonald, W.J.F. & Elsol, J.A. (1979); Pointer, I.R.(1984); Queensland Department of Lands(1995); Queensland Department of Primary Industries (1993); Smyth, A.K. & Corben, C.(1984); Stockton, J.(1979); Thopmson, J.J. (1990b): Thompson, C.H.& Ward, W.T.(1975); Thompson, J & Amos, P.(1991); Timms, B.V.(1986). Collins, P., and Jeesop., R., and Weston, M.A., and Taylor, S. (2000) Review of Impacts to Waterbirds and their habitat from Jet-skis and Hovercraft. Department of natural Resources & Environment, Canberra. Driscoll, P.V. et al (1993). Monitoring of Migratory Waders in the Moreton Bay Region. Queensland Department of Environment and Heritage. Brisbane. Queesnland Parks and Wildlife Service (draft). (2004) Draft Shorebird Management Strategy - Moreton Bay. QPWS, Brisbane.

APPENDIX B

EPBC Act Online Protected Matters Search Tool Results

EPBC Act Protected Matters Report

Matters Search Tool

EPBC Act Protected Matters Report2 October 2007 14:25
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.
You may wish to print this report for reference before moving to other pages or websites.
The Australian Natural Resources Atlas at http://www.environment.gov.au/atlas may provide further environmental information relevant to your selected area. Information about the EPBC Act

including significance guidelines, forms and application process details can be found at http://www.environment.gov.au/epbc/assessmentsapprovals/index.html

Search Type:Area
Buffer:10 km
Coordinates:-27.097777,152.986704, -27.124074,152.986704, -27.124074,153.018885, -27.09777,153.018885

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see

http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html.

World Heritage Properties:None
National Heritage Places: None
Wetlands of International Significance: (Ramsar Sites)1
Commonwealth Marine Areas:None
Threatened Ecological Communities:None

Threatened Species:37
Migratory Species:46

Other Matters Protected by the EPBC Act
This part of the report summarises other matters protected under the

Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage

values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage

laws can be found at
http://www.environment.gov.au/heritage/index.html.

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area

that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales

and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at
http://www.environment.gov.au/epbc/permits/index.html.

Commonwealth Lands:None
Commonwealth Heritage Places: None
Places on the RNE:4
Listed Marine Species:69
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.
State and Territory Reserves:8
Other Commonwealth Reserves:None
Regional Forest Agreements:1

Details
Matters of National Environmental Significance

Wetlands of International Significance [Dataset Information]
(Ramsar Sites) MORETON BAY

Threatened Species [Dataset Information] StatusType of Presence

Birds
Cyclopsitta diophthalma coxeni*
Coxen's Fig-Parrot EndangeredSpecies or species habitat likely to occur within area
Erythrotriorchis radiatus *
Red Goshawk VulnerableSpecies or species habitat likely to occur within area
Geophaps scripta scripta*
Squatter Pigeon (southern) VulnerableSpecies or species habitat likely to occur within area
Lathamus discolor *
Swift Parrot EndangeredSpecies or species habitat may occur within area
Macronectes giganteus *
Southern Giant-Petrel EndangeredSpecies or species habitat may occur within area
Macronectes halli *
Northern Giant-Petrel VulnerableSpecies or species habitat may occur within area
Pterodroma neglecta neglecta*
Kermadec Petrel (western) VulnerableSpecies or species habitat may occur within area
Rostratula australis *
Australian Painted Snipe VulnerableSpecies or species habitat may occur within area
Thalassarche impavida *
Campbell Albatross VulnerableSpecies or species habitat may occur within area
Turnix melanogaster *
Black-breasted Button-quail VulnerableSpecies or species habitat likely to

occur within area
Xanthomyza phrygia *
Regent Honeyeater EndangeredSpecies or species habitat may occur within area

Frogs
Litoria olongburensis *
Wallum Sedge Frog VulnerableSpecies or species habitat likely to occur within area
Mixophyes iteratus *
Southern Barred Frog, Giant Barred Frog EndangeredSpecies or species habitat likely to occur within area

Mammals
Chalinolobus dwyeri *
Large-eared Pied Bat, Large Pied Bat VulnerableSpecies or species habitat may occur within area
Eubalaena australis *
Southern Right Whale EndangeredSpecies or species habitat likely to occur within area
Megaptera novaeangliae *
Humpback Whale VulnerableBreeding known to occur within area
Potorous tridactylus tridactylus*
Long-nosed Potoroo (SE mainland) VulnerableSpecies or species habitat may occur within area
Pteropus poliocephalus *
Grey-headed Flying-fox VulnerableRoosting known to occur within area
Xeromys myoides *
Water Mouse, False Water Rat VulnerableSpecies or species habitat likely to occur within area

Ray-finned fishes
Nannoperca oxleyana *
Oxleyan Pygmy Perch EndangeredSpecies or species habitat likely to occur within area

Reptiles
Caretta caretta *

Loggerhead Turtle EndangeredBreeding may occur within area
Chelonia mydas *
Green Turtle VulnerableSpecies or species habitat may occur within area
Coeranoscincus reticulatus *
Three-toed Snake-tooth Skink VulnerableSpecies or species habitat may occur within area
Dermochelys coriacea *
Leathery Turtle, Leatherback Turtle, Luth VulnerableSpecies or species habitat may occur within area
Lepidochelys olivacea *
Pacific Ridley, Olive Ridley EndangeredSpecies or species habitat may occur within area

Sharks
Carcharias taurus (east coast population)*
Grey Nurse Shark (east coast population) Critically EndangeredSpecies or species habitat may occur within area
Carcharodon carcharias *
Great White Shark VulnerableSpecies or species habitat may occur within area
Rhincodon typus *
Whale Shark VulnerableSpecies or species habitat may occur within area

Plants
Acacia attenuata * VulnerableSpecies or species habitat likely to occur within area
Arthraxon hispidus *
Hairy-joint Grass VulnerableSpecies or species habitat likely to occur within area
Bosistoa selwynii *
Heart-leaved Bosistoa VulnerableSpecies or species habitat likely to occur

within area
Bosistoa transversa *
Three-leaved Bosistoa VulnerableSpecies or species habitat likely to occur

within area
Cryptostylis hunteriana *
Leafless Tongue-orchid VulnerableSpecies or species habitat may occur within area
Dodonaea rupicola * VulnerableSpecies or species habitat likely to occur within area
Macadamia integrifolia *
Macadamia Nut, Queensland Nut, Smooth-shelled Macadamia, Bush Nut, Nut Oak

VulnerableSpecies or species habitat likely to occur within area
Macadamia ternifolia *
Small-fruited Queensland Nut VulnerableSpecies or species habitat likely to occur within area
Phaius australis *
Lesser Swamp-orchid EndangeredSpecies or species habitat likely to occur within area

Migratory Species [Dataset Information] StatusType of Presence

Migratory Terrestrial Species

Birds
Cyclopsitta diophthalma coxeni*
Coxen's Fig-Parrot MigratorySpecies or species habitat likely to occur within area
Haliaeetus leucogaster
White-bellied Sea-Eagle MigratorySpecies or species habitat likely to occur within area
Hirundapus caudacutus
White-throated Needletail MigratorySpecies or species habitat may occur

within area
Merops ornatus *
Rainbow Bee-eater MigratorySpecies or species habitat may occur within area
Monarcha melanopsis
Black-faced Monarch MigratoryBreeding may occur within area
Monarcha trivirgatus
Spectacled Monarch MigratoryBreeding likely to occur within area
Myiagra cyanoleuca
Satin Flycatcher MigratoryBreeding likely to occur within area
Rhipidura rufifrons
Rufous Fantail MigratoryBreeding may occur within area
Xanthomyza phrygia
Regent Honeyeater MigratorySpecies or species habitat may occur within area

Migratory Wetland Species

Birds
Ardea alba
Great Egret, White Egret MigratorySpecies or species habitat may occur within area
Ardea ibis
Cattle Egret MigratoryBreeding likely to occur within area
Arenaria interpres
Ruddy Turnstone MigratorySpecies or species habitat likely to occur within area
Calidris ferruginea
Curlew Sandpiper MigratorySpecies or species habitat likely to occur within area
Charadrius mongolus
Lesser Sand Plover, Mongolian Plover MigratorySpecies or species habitat likely to occur within area
Gallinago hardwickii *
Latham's Snipe, Japanese Snipe MigratorySpecies or species habitat may occur within area
Heteroscelus brevipes
Grey-tailed Tattler MigratorySpecies or species habitat likely to occur within area
Limosa lapponica
Bar-tailed Godwit MigratorySpecies or species habitat likely to occur within area
Nettapus coromandelianus albipennis
Australian Cotton Pygmy-goose MigratorySpecies or species habitat may occur within area
Numenius madagascariensis
Eastern Curlew MigratorySpecies or species habitat likely to occur within area
Numenius phaeopus
Whimbrel MigratorySpecies or species habitat likely to occur within area
Pluvialis fulva
Pacific Golden Plover MigratorySpecies or species habitat likely to occur within area
Rostratula benghalensis s. lat.
Painted Snipe MigratorySpecies or species habitat may occur within area
Xenus cinereus
Terek Sandpiper MigratorySpecies or species habitat likely to occur within area

Migratory Marine Birds
Apus pacificus
Fork-tailed Swift MigratorySpecies or species habitat may occur within area
Ardea alba

Great Egret, White Egret MigratorySpecies or species habitat may occur within area
Ardea ibis
Cattle Egret MigratoryBreeding likely to occur within area
Calonectris leucomelas
Streaked Shearwater MigratorySpecies or species habitat may occur within area
Macronectes giganteus
Southern Giant-Petrel MigratorySpecies or species habitat may occur within area
Macronectes halli
Northern Giant-Petrel MigratorySpecies or species habitat may occur within area
Puffinus leucomelas
Streaked Shearwater MigratorySpecies or species habitat may occur within area
Sterna albifrons
Little Tern MigratorySpecies or species habitat may occur within area
Thalassarche impavida
Campbell Albatross MigratorySpecies or species habitat may occur within area

Migratory Marine Species

Mammals
Balaenoptera edeni
Bryde's Whale MigratorySpecies or species habitat may occur within area
Dugong dugon
Dugong MigratorySpecies or species habitat likely to occur within area
Eubalaena australis *
Southern Right Whale MigratorySpecies or species habitat likely to occur within area
Lagenorhynchus obscurus
Dusky Dolphin MigratorySpecies or species habitat may occur within area
Megaptera novaeangliae *
Humpback Whale MigratoryBreeding known to occur within area
Orcaella brevirostris
Irrawaddy Dolphin MigratorySpecies or species habitat may occur within area
Orcinus orca
Killer Whale, Orca MigratorySpecies or species habitat may occur within area
Sousa chinensis
Indo-Pacific Humpback Dolphin MigratorySpecies or species habitat may occur within area
Reptiles
Caretta caretta *
Loggerhead Turtle MigratoryBreeding may occur within area
Chelonia mydas *
Green Turtle MigratorySpecies or species habitat may occur within area
Dermochelys coriacea *
Leathery Turtle, Leatherback Turtle, Luth MigratorySpecies or species habitat may occur within area
Lepidochelys olivacea *
Pacific Ridley, Olive Ridley MigratorySpecies or species habitat may occur within area
Sharks
Carcharodon carcharias
Great White Shark MigratorySpecies or species habitat may occur within area
Rhincodon typus
Whale Shark MigratorySpecies or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Dataset Information] StatusType of Presence

Birds

Anseranas semipalmata
Magpie Goose Listed - overfly marine areaSpecies or species habitat may occur within area
Apus pacificus
Fork-tailed Swift Listed - overfly marine areaSpecies or species habitat may occur within area
Ardea alba
Great Egret, White Egret Listed - overfly marine areaSpecies or species habitat may occur within area
Ardea ibis
Cattle Egret Listed - overfly marine areaBreeding likely to occur within area
Arenaria interpres
Ruddy Turnstone ListedSpecies or species habitat likely to occur within area
Calidris ferruginea
Curlew Sandpiper Listed - overfly marine areaSpecies or species habitat likely to occur within area
Calonectris leucomelas
Streaked Shearwater ListedSpecies or species habitat may occur within area
Charadrius mongolus
Lesser Sand Plover, Mongolian Plover ListedSpecies or species habitat likely to occur within area
Gallinago hardwickii *
Latham's Snipe, Japanese Snipe Listed - overfly marine areaSpecies or species habitat may occur within area
Haliaeetus leucogaster
White-bellied Sea-Eagle ListedSpecies or species habitat likely to occur within area
Heteroscelus brevipes
Grey-tailed Tattler ListedSpecies or species habitat likely to occur within area
Hirundapus caudacutus
White-throated Needletail Listed - overfly marine areaSpecies or species habitat may occur within area
Lathamus discolor *
Swift Parrot Listed - overfly marine areaSpecies or species habitat may occur within area
Limosa lapponica
Bar-tailed Godwit ListedSpecies or species habitat likely to occur within area
Macronectes giganteus
Southern Giant-Petrel ListedSpecies or species habitat may occur within area
Macronectes halli
Northern Giant-Petrel ListedSpecies or species habitat may occur within area
Merops ornatus *
Rainbow Bee-eater Listed - overfly marine areaSpecies or species habitat may occur within area
Monarcha melanopsis
Black-faced Monarch Listed - overfly marine areaBreeding may occur within area
Monarcha trivirgatus
Spectacled Monarch Listed - overfly marine areaBreeding likely to occur within area
Myiagra cyanoleuca
Satin Flycatcher Listed - overfly marine areaBreeding likely to occur within area
Nettapus coromandelianus albipennis
Australian Cotton Pygmy-goose Listed - overfly marine areaSpecies or species habitat may occur within area
Numenius madagascariensis

Eastern Curlew ListedSpecies or species habitat likely to occur within area
Numenius phaeopus
Whimbrel ListedSpecies or species habitat likely to occur within area
Pluvialis fulva
Pacific Golden Plover ListedSpecies or species habitat likely to occur within area
Rhipidura rufifrons
Rufous Fantail Listed - overfly marine areaBreeding may occur within area
Rostratula benghalensis s. lat.
Painted Snipe Listed - overfly marine areaSpecies or species habitat may occur within area
Sterna albifrons
Little Tern ListedSpecies or species habitat may occur within area
Thalassarche impavida
Campbell Albatross ListedSpecies or species habitat may occur within area
Xenus cinereus
Terek Sandpiper Listed - overfly marine areaSpecies or species habitat likely to occur within area

Mammals
Dugong dugon
Dugong ListedSpecies or species habitat likely to occur within area

Ray-finned fishes
Acentronura tentaculata
Hairy Pygmy Pipehorse ListedSpecies or species habitat may occur within area
Campichthys tryoni
Tryon's Pipefish ListedSpecies or species habitat may occur within area
Corythoichthys amplexus
Fijian Banded Pipefish, Brown-banded Pipefish ListedSpecies or species habitat may occur within area
Corythoichthys ocellatus
Orange-spotted Pipefish, Ocellated Pipefish ListedSpecies or species habitat may occur within area
Festucalex cinctus
Girdled Pipefish ListedSpecies or species habitat may occur within area
Filicampus tigris
Tiger Pipefish ListedSpecies or species habitat may occur within area
Halicampus grayi
Mud Pipefish, Gray's Pipefish ListedSpecies or species habitat may occur within area
Hippichthys cyanospilos
Blue-speckled Pipefish, Blue-spotted Pipefish ListedSpecies or species habitat may occur within area
Hippichthys heptagonus
Madura Pipefish, Reticulated Freshwater Pipefish ListedSpecies or species habitat may occur within area
Hippichthys penicillus
Beady Pipefish, Steep-nosed Pipefish ListedSpecies or species habitat may occur within area
Hippocampus kelloggi
Kellogg's Seahorse ListedSpecies or species habitat may occur within area
Hippocampus kuda
Spotted Seahorse, Yellow Seahorse ListedSpecies or species habitat may occur within area
Hippocampus planifrons
Flat-face Seahorse ListedSpecies or species habitat may occur within area
Hippocampus whitei
White's Seahorse, Crowned Seahorse, Sydney Seahorse ListedSpecies or species habitat may occur within area
Lissocampus runa
Javelin Pipefish ListedSpecies or species habitat may occur within area
Maroubra perserrata
Sawtooth Pipefish ListedSpecies or species habitat may occur within area
Micrognathus andersonii
Anderson's Pipefish, Shortnose Pipefish ListedSpecies or species habitat

may occur within area
Micrognathus brevirostris
Thorn-tailed Pipefish ListedSpecies or species habitat may occur within area
Microphis manadensis
Manado River Pipefish, Manado Pipefish ListedSpecies or species habitat may occur within area
Solegnathus dunckeri
Duncker's Pipehorse ListedSpecies or species habitat may occur within area
Solegnathus hardwickii
Pipehorse ListedSpecies or species habitat may occur within area
Solegnathus spinosissimus
Spiny Pipehorse, Australian Spiny Pipehorse ListedSpecies or species habitat may occur within area
Solenostomus cyanopterus
Blue-finned Ghost Pipefish, Robust Ghost Pipefish ListedSpecies or species habitat may occur within area
Solenostomus paradoxus
Harlequin Ghost Pipefish, Ornate Ghost Pipefish ListedSpecies or species habitat may occur within area
Stigmatopora nigra
Wide-bodied Pipefish, Black Pipefish ListedSpecies or species habitat may occur within area
Syngnathoides biaculeatus
Double-ended Pipehorse, Alligator Pipefish ListedSpecies or species habitat may occur within area
Trachyrhamphus bicoarctatus
Bend Stick Pipefish, Short-tailed Pipefish ListedSpecies or species habitat may occur within area
Urocampus carinirostris
Hairy Pipefish ListedSpecies or species habitat may occur within area
Vanacampus margaritifer
Mother-of-pearl Pipefish ListedSpecies or species habitat may occur within area
Reptiles
Aipysurus laevis
Olive Seasnake ListedSpecies or species habitat may occur within area
Astrotia stokesii
Stokes' Seasnake ListedSpecies or species habitat may occur within area
Caretta caretta *
Loggerhead Turtle ListedBreeding may occur within area
Chelonia mydas *
Green Turtle ListedSpecies or species habitat may occur within area
Dermochelys coriacea *
Leathery Turtle, Leatherback Turtle, Luth ListedSpecies or species habitat may occur within area
Emydocephalus annulatus
Turtle-headed Seasnake ListedSpecies or species habitat may occur within area
Hydrophis elegans
Elegant Seasnake ListedSpecies or species habitat may occur within area
Laticauda laticaudata
a sea krait ListedSpecies or species habitat may occur within area
Lepidochelys olivacea *
Pacific Ridley, Olive Ridley ListedSpecies or species habitat may occur within area
Pelamis platurus
Yellow-bellied Seasnake ListedSpecies or species habitat may occur within area

Whales and Other Cetaceans [Dataset Information] StatusType of Presence
Balaenoptera acutorostrata
Minke Whale CetaceanSpecies or species habitat may occur within area
Balaenoptera edeni
Bryde's Whale CetaceanSpecies or species habitat may occur within area

Delphinus delphis
Common Dolphin CetaceanSpecies or species habitat may occur within area
Eubalaena australis *
Southern Right Whale CetaceanSpecies or species habitat likely to occur within area
Grampus griseus
Risso's Dolphin, Grampus CetaceanSpecies or species habitat may occur within area
Lagenorhynchus obscurus
Dusky Dolphin CetaceanSpecies or species habitat may occur within area
Megaptera novaeangliae *
Humpback Whale CetaceanBreeding known to occur within area
Orcaella brevirostris
Irrawaddy Dolphin CetaceanSpecies or species habitat may occur within area
Orcinus orca
Killer Whale, Orca CetaceanSpecies or species habitat may occur within area
Sousa chinensis
Indo-Pacific Humpback Dolphin CetaceanSpecies or species habitat may occur within area
Stenella attenuata
Spotted Dolphin, Pantropical Spotted Dolphin CetaceanSpecies or species habitat may occur within area
Tursiops aduncus
Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin CetaceanSpecies or species habitat likely to occur within area
Tursiops truncatus s. str.
Bottlenose Dolphin CetaceanSpecies or species habitat may occur within area
Places on the RNE [Dataset Information]
Note that not all Indigenous sites may be listed.
Indigenous
Toorbul Point Bora Ground QLD
Natural
Pumicestone Passage - Bribie Island QLD
Redcliffe National Park QLD
Sheep Station Creek Environmental Park QLD

Extra Information
State and Territory Reserves [Dataset Information]
Beachmere Conservation Park, QLD
Deception Bay Fish Habitat Area, QLD
Freshwater National Park, QLD
Kippa-Ring Fish Habitat Area, QLD
Moreton Bay Marine Park, QLD
Pumicestone Channel Fish Habitat Area, QLD
Sheep Station Creek Conservation Park, QLD
Toorbul Conservation Park, QLD
Regional Forest Agreements [Dataset Information]
Note that all RFA areas including those still under consideration have been included.
South East Queensland RFA, Queensland

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 migratory and marine provisions of the Act have been mapped.

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.

Acknowledgments

This database has been compiled from a range of data sources. The Department acknowledges the following custodians who have contributed valuable data and advice:

- New South Wales National Parks and Wildlife Service
- Department of Sustainability and Environment, Victoria
- Department of Primary Industries, Water and Environment, Tasmania
- Department of Environment and Heritage, South Australia Planning SA
- Parks and Wildlife Commission of the Northern Territory
- Environmental Protection Agency, Queensland
- Birds Australia
- Australian Bird and Bat Banding Scheme
- Australian National Wildlife Collection
- Natural history museums of Australia
- 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
- Other groups and individuals

ANUClim Version 1.8, Centre for Resource and Environmental Studies, Australian National University was used extensively for the production of draft maps of species distribution. Environment Australia is extremely grateful to the many

organisations and individuals who provided expert advice and information on numerous draft distributions.

APPENDIX C

Wildlife Online Database Search Results

Queensland Government
Environmental Protection Agency
Queensland Parks and Wildlife Service

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: 27.12
Longitude: 152.98
Distance: 10
Email: monica.campbell@cardno.com.au
Date submitted: Tuesday 02 Oct 2007 14:31:10
Date extracted: Tuesday 02 Oct 2007 14:46:02

The number of records retrieved = 1054

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	*Bufo marinus*	cane toad	Y			48
animals	amphibians	Hylidae	*Litoria fallax*	eastern sedgefrog		C		41
animals	amphibians	Hylidae	*Litoria nasuta*	striped rocketfrog		C		26
animals	amphibians	Hylidae	*Litoria tyleri*	southern laughing treefrog		C		4
animals	amphibians	Hylidae	*Litoria rubella*	ruddy treefrog		C		14
animals	amphibians	Hylidae	*Litoria peronii*	emerald spotted treefrog		C		5
animals	amphibians	Hylidae	*Litoria dentata*	bleating treefrog		C		5
animals	amphibians	Hylidae	*Litoria caerulea*	common green treefrog		C		53
animals	amphibians	Hylidae	*Litoria gracilenta*	graceful treefrog		C		19
animals	amphibians	Hylidae	*Litoria lesueuri sensu lato*	stony creek frog		C		1
animals	amphibians	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog		C		7
animals	amphibians	Hylidae	*Litoria wilcoxii*			C		4
animals	amphibians	Myobatrachidae	*Crinia tinnula*	wallum froglet		V		15/7
animals	amphibians	Myobatrachidae	*Adelotus brevis*	tusked frog		V		6
animals	amphibians	Myobatrachidae	*Uperoleia fusca*	dusky gungan		C		2
animals	amphibians	Myobatrachidae	*Crinia signifera*	clicking froglet		C		4
animals	amphibians	Myobatrachidae	*Mixophyes iteratus*	giant barred frog		E	E	3
animals	amphibians	Myobatrachidae	*Pseudophryne raveni*	copper backed broodfrog		C		13/1
animals	amphibians	Myobatrachidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk		C		8
animals	amphibians	Myobatrachidae	*Limnodynastes tasmaniensis*	spotted grassfrog		C		15
animals	amphibians	Myobatrachidae	*Mixophyes fasciolatus*	great barred frog		C		1
animals	amphibians	Myobatrachidae	*Limnodynastes peronii*	striped marshfrog		C		51
animals	amphibians	Myobatrachidae	*Limnodynastes ornatus*	ornate burrowing frog		C		14
animals	amphibians	Myobatrachidae	*Crinia parinsignifera*	beeping froglet		C		15
animals	amphibians	Myobatrachidae	*Pseudophryne major*	great brown broodfrog		C		3
animals	amphibians	Myobatrachidae	*Uperoleia rugosa*	chubby gungan		C		2/1
animals	birds	Accipitridae	*Aquila audax*	wedge-tailed eagle		C		16
animals	birds	Accipitridae	*Milvus migrans*	black kite		C		5
animals	birds	Accipitridae	*Haliastur indus*	brahminy kite		C		96
animals	birds	Accipitridae	*Circus approximans*	swamp harrier		C		13
animals	birds	Accipitridae	*Accipiter fasciatus*	brown goshawk		C		53
animals	birds	Accipitridae	*Haliastur sphenurus*	whistling kite		C		141
animals	birds	Accipitridae	*Hieraaetus morphnoides*	little eagle		C		20
animals	birds	Accipitridae	*Accipiter novaehollandiae*	grey goshawk		R		16
animals	birds	Accipitridae	*Erythrotriorchis radiatus*	red goshawk		E	V	1
animals	birds	Accipitridae	*Accipiter cirrhocephalus*	collared sparrowhawk		C		14
animals	birds	Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle		C		72
animals	birds	Accipitridae	*Aviceda subcristata*	Pacific baza		C		46
animals	birds	Accipitridae	*Lophoictinia isura*	square-tailed kite		R		82
animals	birds	Accipitridae	*Pandion haliaetus*	osprey		C		48
animals	birds	Accipitridae	*Elanus axillaris*	black-shouldered kite		C		53/1
animals	birds	Accipitridae	*Circus assimilis*	spotted harrier		C		4
animals	birds	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar		C		18
animals	birds	Alaudidae	*Mirafra javanica*	singing bushlark		C		4
animals	birds	Alcedinidae	*Alcedo azurea*	azure kingfisher		C		51
animals	birds	Anatidae	*Anas castanea*	chestnut teal		C		88

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Anatidae	*Anas gracilis*	grey teal		C		84
animals	birds	Anatidae	*Cygnus atratus*	black swan		C		43
animals	birds	Anatidae	*Anas superciliosa*	Pacific black duck		C		192
animals	birds	Anatidae	*Aythya australis*	hardhead		C		19
animals	birds	Anatidae	*Anas rhynchotis*	Australasian shoveler		C		23
animals	birds	Anatidae	*Biziura lobata*	musk duck		C		1
animals	birds	Anatidae	*Chenonetta jubata*	Australian wood duck		C		136
animals	birds	Anatidae	*Malacorhynchus membranaceus*	pink-eared duck		C		11
animals	birds	Anatidae	*Nettapus coromandelianus*	cotton pygmy-goose		R		2
animals	birds	Anatidae	*Stictonetta naevosa*	freckled duck		R		8
animals	birds	Anatidae	*Dendrocygna arcuata*	wandering whistling-duck		C		7
animals	birds	Anatidae	*Dendrocygna eytoni*	plumed whistling-duck		C		20
animals	birds	Anatidae	*Anas platyrhynchos*	mallard	Y			6
animals	birds	Anhingidae	*Anhinga melanogaster*	darter		C		58
animals	birds	Anseranatidae	*Anseranas semipalmata*	magpie goose		C		28
animals	birds	Apodidae	*Apus affinis*	house swift		C		2
animals	birds	Apodidae	*Apus pacificus*	fork-tailed swift		C		3
animals	birds	Apodidae	*Hirundapus caudacutus*	white-throated needletail		C		47
animals	birds	Ardeidae	*Ardea alba*	great egret		C		125
animals	birds	Ardeidae	*Ardea ibis*	cattle egret		C		127
animals	birds	Ardeidae	*Egretta sacra*	eastern reef egret		C		3
animals	birds	Ardeidae	*Ardea intermedia*	intermediate egret		C		62
animals	birds	Ardeidae	*Butorides striatus*	striated heron		C		26
animals	birds	Ardeidae	*Egretta novaehollandiae*	white-faced heron		C		174
animals	birds	Ardeidae	*Nycticorax caledonicus*	nankeen night heron		C		40
animals	birds	Ardeidae	*Ixobrychus flavicollis*	black bittern		C		4
animals	birds	Ardeidae	*Botaurus poiciloptilus*	Australasian bittern		C		2
animals	birds	Ardeidae	*Ixobrychus minutus*	little bittern		C		7
animals	birds	Ardeidae	*Egretta garzetta*	little egret		C		46
animals	birds	Ardeidae	*Ardea pacifica*	white-necked heron		C		38
animals	birds	Artamidae	*Cracticus torquatus*	grey butcherbird		C		109
animals	birds	Artamidae	*Artamus cyanopterus*	dusky woodswallow		C		17
animals	birds	Artamidae	*Strepera graculina*	pied currawong		C		17
animals	birds	Artamidae	*Cracticus nigrogularis*	pied butcherbird		C		196
animals	birds	Artamidae	*Artamus superciliosus*	white-browed woodswallow		C		5
animals	birds	Artamidae	*Artamus sp.*					1
animals	birds	Artamidae	*Gymnorhina tibicen*	Australian magpie		C		221
animals	birds	Artamidae	*Artamus minor*	little woodswallow		C		2
animals	birds	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow		C		44
animals	birds	Burhinidae	*Burhinus grallarius*	bush stone-curlew		C		8
animals	birds	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo		C		123
animals	birds	Cacatuidae	*Calyptorhynchus funereus*	yellow-tailed black-cockatoo		C		50
animals	birds	Cacatuidae	*Calyptorhynchus lathami*	glossy black-cockatoo		V		1
animals	birds	Cacatuidae	*Calyptorhynchus banksii*	red-tailed black-cockatoo		C		3
animals	birds	Cacatuidae	*Nymphicus hollandicus*	cockatiel		C		5
animals	birds	Cacatuidae	*Cacatua tenuirostris*	long-billed corella	Y	C		10

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Cacatuidae	*Cacatua roseicapilla*	galah		C		113
animals	birds	Cacatuidae	*Cacatua sanguinea*	little corella		C		23
animals	birds	Campephagidae	*Lalage sueurii*	white-winged triller		C		33
animals	birds	Campephagidae	*Lalage leucomela*	varied triller		C		51
animals	birds	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike		C		216
animals	birds	Campephagidae	*Coracina tenuirostris*	cicadabird		C		82
animals	birds	Campephagidae	*Coracina papuensis*	white-bellied cuckoo-shrike		C		67
animals	birds	Campephagidae	*Coracina lineata*	barred cuckoo-shrike		C		12
animals	birds	Caprimulgidae	*Eurostopodus mystacalis*	white-throated nightjar		C		13
animals	birds	Centropodidae	*Centropus phasianinus*	pheasant coucal		C		104
animals	birds	Charadriidae	*Pluvialis fulva*	Pacific golden plover		C		36
animals	birds	Charadriidae	*Elseyornis melanops*	black-fronted dotterel		C		25
animals	birds	Charadriidae	*Charadrius bicinctus*	double-banded plover		C		3
animals	birds	Charadriidae	*Charadrius mongolus*	lesser sand plover		C		57
animals	birds	Charadriidae	*Vanellus tricolor*	banded lapwing		C		11
animals	birds	Charadriidae	*Erythrogonys cinctus*	red-kneed dotterel		C		12
animals	birds	Charadriidae	*Charadrius leschenaultii*	greater sand plover		C		18
animals	birds	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)		C		208
animals	birds	Charadriidae	*Charadrius ruficapillus*	red-capped plover		C		19
animals	birds	Ciconiidae	*Ephippiorhynchus asiaticus*	black-necked stork		R		45
animals	birds	Cinclosomatidae	*Psophodes olivaceus*	eastern whipbird		C		155
animals	birds	Climacteridae	*Climacteris picumnus*	brown treecreeper		C		7
animals	birds	Climacteridae	*Cormobates leucophaeus metastasis*	white-throated treecreeper (southern)		C		118
animals	birds	Climacteridae	*Cormobates leucophaeus*	white-throated treecreeper		C		2
animals	birds	Columbidae	*Columba livia*	rock dove	Y			31
animals	birds	Columbidae	*Lopholaimus antarcticus*	topknot pigeon		C		9
animals	birds	Columbidae	*Streptopelia chinensis*	spotted turtle-dove	Y			124
animals	birds	Columbidae	*Macropygia amboinensis*	brown cuckoo-dove		C		126
animals	birds	Columbidae	*Ptilinopus superbus*	superb fruit-dove		C		6
animals	birds	Columbidae	*Geopelia humeralis*	bar-shouldered dove		C		158
animals	birds	Columbidae	*Columba leucomela*	white-headed pigeon		C		5
animals	birds	Columbidae	*Ocyphaps lophotes*	crested pigeon		C		155
animals	birds	Columbidae	*Phaps chalcoptera*	common bronzewing		C		24
animals	birds	Columbidae	*Chalcophaps indica*	emerald dove		C		15
animals	birds	Columbidae	*Ptilinopus regina*	rose-crowned fruit-dove		C		13
animals	birds	Columbidae	*Geopelia striata*	peaceful dove		C		237
animals	birds	Coraciidae	*Eurystomus orientalis*	dollarbird		C		117
animals	birds	Corvidae	*Corvus orru*	Torresian crow		C		337
animals	birds	Cuculidae	*Cuculus pallidus*	pallid cuckoo		C		28
animals	birds	Cuculidae	*Chrysococcyx minutillus*	little bronze-cuckoo		C		16
animals	birds	Cuculidae	*Scythrops novaehollandiae*	channel-billed cuckoo		C		37
animals	birds	Cuculidae	*Cacomantis flabelliformis*	fan-tailed cuckoo		C		99
animals	birds	Cuculidae	*Cacomantis variolosus*	brush cuckoo		C		48
animals	birds	Cuculidae	*Cuculus saturatus*	oriental cuckoo		C		12
animals	birds	Cuculidae	*Chrysococcyx basalis*	Horsfield's bronze-cuckoo		C		11
animals	birds	Cuculidae	*Chrysococcyx lucidus*	shining bronze-cuckoo		C		38

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Cuculidae	*Eudynamys scolopacea*	common koel		C		84
animals	birds	Dicaeidae	*Dicaeum hirundinaceum*	mistletoebird		C		95
animals	birds	Dicruridae	*Myiagra alecto*	shining flycatcher		C		11
animals	birds	Dicruridae	*Myiagra inquieta*	restless flycatcher		C		21
animals	birds	Dicruridae	*Myiagra rubecula*	leaden flycatcher		C		90
animals	birds	Dicruridae	*Myiagra cyanoleuca*	satin flycatcher		C		7
animals	birds	Dicruridae	*Grallina cyanoleuca*	magpie-lark		C		244
animals	birds	Dicruridae	*Rhipidura rufifrons*	rufous fantail		C		39
animals	birds	Dicruridae	*Rhipidura fuliginosa*	grey fantail		C		179
animals	birds	Dicruridae	*Dicrurus bracteatus bracteatus*	spangled drongo (eastern Australia)		C		3
animals	birds	Dicruridae	*Rhipidura leucophrys leucophrys*	willie wagtail (southern)		C		1
animals	birds	Dicruridae	*Rhipidura leucophrys*	willie wagtail		C		178
animals	birds	Dicruridae	*Monarcha trivirgatus*	spectacled monarch		C		24
animals	birds	Dicruridae	*Monarcha melanopsis*	black-faced monarch		C		37
animals	birds	Dicruridae	*Dicrurus bracteatus*	spangled drongo		C		133
animals	birds	Dicruridae	*Monarcha leucotis*	white-eared monarch		C		9
animals	birds	Falconidae	*Falco berigora*	brown falcon		C		4
animals	birds	Falconidae	*Falco peregrinus*	peregrine falcon		C		15
animals	birds	Falconidae	*Falco cenchroides*	nankeen kestrel		C		24
animals	birds	Falconidae	*Falco longipennis*	Australian hobby		C		23
animals	birds	Fregatidae	*Fregata ariel*	lesser frigatebird		C		1
animals	birds	Gruidae	*Grus rubicunda*	brolga		C		54
animals	birds	Haematopodidae	*Haematopus longirostris*	pied oystercatcher		C		18
animals	birds	Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra		C		198
animals	birds	Halcyonidae	*Todiramphus chloris*	collared kingfisher		C		61
animals	birds	Halcyonidae	*Todiramphus pyrrhopygia*	red-backed kingfisher		C		5
animals	birds	Halcyonidae	*Todiramphus macleayii*	forest kingfisher		C		111
animals	birds	Halcyonidae	*Todiramphus sanctus*	sacred kingfisher		C		113
animals	birds	Hirundinidae	*Hirundo sp.*					1
animals	birds	Hirundinidae	*Hirundo ariel*	fairy martin		C		41
animals	birds	Hirundinidae	*Hirundo nigricans*	tree martin		C		36
animals	birds	Hirundinidae	*Hirundo neoxena*	welcome swallow		C		188
animals	birds	Hirundinidae	*Cheramoeca leucosternus*	white-backed swallow		C		4
animals	birds	Jacanidae	*Irediparra gallinacea*	comb-crested jacana		C		26
animals	birds	Laridae	*Sterna bergii*	crested tern		C		24
animals	birds	Laridae	*Sterna hirundo*	common tern		C		7
animals	birds	Laridae	*Sterna caspia*	Caspian tern		C		86
animals	birds	Laridae	*Sterna nilotica*	gull-billed tern		C		43
animals	birds	Laridae	*Chlidonias hybridus*	whiskered tern		C		2
animals	birds	Laridae	*Chlidonias leucopterus*	white-winged black tern		C		2
animals	birds	Laridae	*Larus novaehollandiae*	silver gull		C		89
animals	birds	Laridae	*Sterna albifrons*	little tern		E		13
animals	birds	Maluridae	*Malurus sp.*					1
animals	birds	Maluridae	*Malurus cyaneus*	superb fairy-wren		C		5
animals	birds	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren		C		116
animals	birds	Maluridae	*Malurus lamberti*	variegated fairy-wren		C		158

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Megapodiidae	*Alectura lathami*	Australian brush-turkey		C		37
animals	birds	Meliphagidae	*Manorina melanocephala*	noisy miner		C		126
animals	birds	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater		C		160
animals	birds	Meliphagidae	*Anthochaera chrysoptera*	little wattlebird		C		64
animals	birds	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater		C		125
animals	birds	Meliphagidae	*Lichenostomus versicolor*	varied honeyeater		C		1
animals	birds	Meliphagidae	*Acanthagenys rufogularis*	spiny-cheeked honeyeater		C		2
animals	birds	Meliphagidae	*Philemon citreogularis*	little friarbird		C		37
animals	birds	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater		C		57
animals	birds	Meliphagidae	*Lichenostomus melanops*	yellow-tufted honeyeater		C		2
animals	birds	Meliphagidae	*Lichenostomus chrysops*	yellow-faced honeyeater		C		128
animals	birds	Meliphagidae	*Philemon corniculatus*	noisy friarbird		C		143
animals	birds	Meliphagidae	*Melithreptus lunatus*	white-naped honeyeater		C		32
animals	birds	Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater		R		8
animals	birds	Meliphagidae	*Lichmera indistincta*	brown honeyeater		C		169
animals	birds	Meliphagidae	*Lichenostomus fuscus*	fuscous honeyeater		C		130
animals	birds	Meliphagidae	*Xanthomyza phrygia*	regent honeyeater		E	E	1
animals	birds	Meliphagidae	*Phylidonyris nigra*	white-cheeked honeyeater		C		15
animals	birds	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater		C		43
animals	birds	Meliphagidae	*Meliphaga lewinii*	Lewin's honeyeater		C		177
animals	birds	Meliphagidae	*Myzomela obscura*	dusky honeyeater		C		5
animals	birds	Meliphagidae	*Grantiella picta*	painted honeyeater		R		1
animals	birds	Meliphagidae	*Acanthorhynchus tenuirostris*	eastern spinebill		C		11
animals	birds	Meliphagidae	*Lichenostomus fasciogularis*	mangrove honeyeater		C		59
animals	birds	Meliphagidae	*Melithreptus brevirostris*	brown-headed honeyeater		C		1
animals	birds	Meropidae	*Merops ornatus*	rainbow bee-eater		C		110
animals	birds	Motacillidae	*Anthus novaeseelandiae*	Richard's pipit		C		49
animals	birds	Muscicapidae	*Zoothera heinei*	russet-tailed thrush		C		1/1
animals	birds	Neosittidae	*Daphoenositta chrysoptera*	varied sittella		C		28
animals	birds	Oriolidae	*Oriolus sagittatus*	olive-backed oriole		C		113
animals	birds	Oriolidae	*Sphecotheres viridis*	figbird		C		95
animals	birds	Orthonychidae	*Orthonyx temminckii*	logrunner		C		1
animals	birds	Pachycephalidae	*Falcunculus frontatus*	crested shrike-tit		C		77
animals	birds	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush		C		234
animals	birds	Pachycephalidae	*Pachycephala pectoralis*	golden whistler		C		78
animals	birds	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler		C		214
animals	birds	Pachycephalidae	*Colluricincla megarhyncha*	little shrike-thrush		C		45
animals	birds	Pardalotidae	*Acanthiza nana*	yellow thornbill		C		1
animals	birds	Pardalotidae	*Gerygone mouki*	brown gerygone		C		19
animals	birds	Pardalotidae	*Sericornis sp.*					1
animals	birds	Pardalotidae	*Chthonicola sagittata*	speckled warbler		C		1
animals	birds	Pardalotidae	*Acanthiza chrysorrhoa*	yellow-rumped thornbill		C		2
animals	birds	Pardalotidae	*Sericornis frontalis*	white-browed scrubwren		C		102
animals	birds	Pardalotidae	*Pardalotus punctatus*	spotted pardalote		C		26
animals	birds	Pardalotidae	*Pardalotus striatus*	striated pardalote		C		178
animals	birds	Pardalotidae	*Gerygone levigaster*	mangrove gerygone		C		62

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Pardalotidae	*Gerygone olivacea*	white-throated gerygone		C		87
animals	birds	Pardalotidae	*Acanthiza pusilla*	brown thornbill		C		74
animals	birds	Pardalotidae	*Acanthiza lineata*	striated thornbill		C		7
animals	birds	Pardalotidae	*Sericornis citreogularis*	yellow-throated scrubwren		C		1
animals	birds	Pardalotidae	*Smicrornis brevirostris*	weebill		C		2
animals	birds	Pardalotidae	*Sericornis magnirostris*	large-billed scrubwren		C		13
animals	birds	Passeridae	*Taeniopygia guttata*	zebra finch		C		4
animals	birds	Passeridae	*Passer domesticus*	house sparrow	Y			24
animals	birds	Passeridae	*Neochmia temporalis*	red-browed finch		C		100
animals	birds	Passeridae	*Lonchura punctulata*	nutmeg mannikin	Y			9
animals	birds	Passeridae	*Neochmia modesta*	plum-headed finch		C		1
animals	birds	Passeridae	*Taeniopygia bichenovii*	double-barred finch		C		90
animals	birds	Passeridae	*Lonchura castaneothorax*	chestnut-breasted mannikin		C		30
animals	birds	Pelecanidae	*Pelecanus conspicillatus*	Australian pelican		C		99
animals	birds	Petroicidae	*Petroica rosea*	rose robin		C		40
animals	birds	Petroicidae	*Microeca fascinans*	jacky winter		C		11
animals	birds	Petroicidae	*Eopsaltria australis*	eastern yellow robin		C		181
animals	birds	Petroicidae	*Petroica goodenovii*	red-capped robin		C		9
animals	birds	Phalacrocoracidae	*Phalacrocorax sp.*					1
animals	birds	Phalacrocoracidae	*Phalacrocorax varius*	pied cormorant		C		47
animals	birds	Phalacrocoracidae	*Phalacrocorax carbo*	great cormorant		C		9
animals	birds	Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant		C		83
animals	birds	Phalacrocoracidae	*Phalacrocorax melanoleucos*	little pied cormorant		C		102
animals	birds	Phasianidae	*Coturnix sp.*					1
animals	birds	Phasianidae	*Coturnix chinensis*	king quail		C		1
animals	birds	Phasianidae	*Coturnix pectoralis*	stubble quail		C		6
animals	birds	Phasianidae	*Coturnix ypsilophora*	brown quail		C		35
animals	birds	Pittidae	*Pitta versicolor*	noisy pitta		C		4
animals	birds	Podargidae	*Podargus strigoides*	tawny frogmouth		C		50
animals	birds	Podicipedidae	*Podiceps cristatus*	great crested grebe		C		1
animals	birds	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe		C		71
animals	birds	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler		C		21
animals	birds	Procellariidae	*Lugensa brevirostris*	Kerguelen petrel		C		1/1
animals	birds	Procellariidae	*Puffinus tenuirostris*	short-tailed shearwater		C		3/1
animals	birds	Psittacidae	*Lathamus discolor*	swift parrot		E	E	1
animals	birds	Psittacidae	*Platycercus elegans*	crimson rosella		C		6
animals	birds	Psittacidae	*Alisterus scapularis*	Australian king-parrot		C		27
animals	birds	Psittacidae	*Platycercus adscitus*	pale-headed rosella		C		187
animals	birds	Psittacidae	*Psephotus haematonotus*	red-rumped parrot		C		1
animals	birds	Psittacidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet		C		184
animals	birds	Psittacidae	*Trichoglossus haematodus moluccanus*	rainbow lorikeet		C		254
animals	birds	Psittacidae	*Platycercus adscitus palliceps*	pale-headed rosella (southern form)		C		5
animals	birds	Psittacidae	*Aprosmictus erythropterus*	red-winged parrot		C		5
animals	birds	Psittacidae	*Glossopsitta concinna*	musk lorikeet		C		1
animals	birds	Psittacidae	*Glossopsitta pusilla*	little lorikeet		C		72
animals	birds	Psittacidae	*Platycercus eximius*	eastern rosella		C		11

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Psittacidae	*Neophema pulchella*	turquoise parrot		R		7
animals	birds	Ptilonorhynchidae	*Ptilonorhynchus violaceus*	satin bowerbird		C		6
animals	birds	Rallidae	*Fulica atra*	Eurasian coot		C		14
animals	birds	Rallidae	*Porzana fluminea*	Australian spotted crake		C		2
animals	birds	Rallidae	*Porzana tabuensis*	spotless crake		C		4
animals	birds	Rallidae	*Gallinula tenebrosa*	dusky moorhen		C		70
animals	birds	Rallidae	*Amaurornis olivaceus*	bush-hen		C		4
animals	birds	Rallidae	*Gallirallus philippensis*	buff-banded rail		C		17
animals	birds	Rallidae	*Porphyrio porphyrio*	purple swamphen		C		112
animals	birds	Rallidae	*Rallus pectoralis*	Lewin's rail		R		2
animals	birds	Rallidae	*Porzana pusilla*	Baillon's crake		C		7
animals	birds	Recurvirostridae	*Himantopus himantopus*	black-winged stilt		C		150
animals	birds	Recurvirostridae	*Recurvirostra novaehollandiae*	red-necked avocet		C		28
animals	birds	Rostratulidae	*Rostratula australis*	Australian painted snipe		V	V	10
animals	birds	Scolopacidae	*Calidris alba*	sanderling		C		1
animals	birds	Scolopacidae	*Limosa limosa*	black-tailed godwit		C		61
animals	birds	Scolopacidae	*Tringa glareola*	wood sandpiper		C		13
animals	birds	Scolopacidae	*Numenius minutus*	little curlew		C		2
animals	birds	Scolopacidae	*Limosa lapponica*	bar-tailed godwit		C		176
animals	birds	Scolopacidae	*Calidris canutus*	red knot		C		14
animals	birds	Scolopacidae	*Xenus cinereus*	terek sandpiper		C		51
animals	birds	Scolopacidae	*Tringa nebularia*	common greenshank		C		96
animals	birds	Scolopacidae	*Numenius madagascariensis*	eastern curlew		R		150
animals	birds	Scolopacidae	*Limnodromus semipalmatus*	Asian dowitcher		C		3
animals	birds	Scolopacidae	*Heteroscelus brevipes*	grey-tailed tattler		C		86
animals	birds	Scolopacidae	*Calidris tenuirostris*	great knot		C		71
animals	birds	Scolopacidae	*Limicola falcinellus*	broad-billed sandpiper		C		2
animals	birds	Scolopacidae	*Gallinago hardwickii*	Latham's snipe		C		25
animals	birds	Scolopacidae	*Calidris ruficollis*	red-necked stint		C		41
animals	birds	Scolopacidae	*Calidris ferruginea*	curlew sandpiper		C		85
animals	birds	Scolopacidae	*Tringa stagnatilis*	marsh sandpiper		C		60
animals	birds	Scolopacidae	*Philomachus pugnax*	ruff		C		1
animals	birds	Scolopacidae	*Calidris acuminata*	sharp-tailed sandpiper		C		30
animals	birds	Scolopacidae	*Arenaria interpres*	ruddy turnstone		C		10
animals	birds	Scolopacidae	*Actitis hypoleucos*	common sandpiper		C		4
animals	birds	Scolopacidae	*Numenius phaeopus*	whimbrel		C		176
animals	birds	Strigidae	*Ninox strenua*	powerful owl		V		1
animals	birds	Strigidae	*Ninox novaeseelandiae*	southern boobook		C		43
animals	birds	Strigidae	*Ninox connivens*	barking owl		C		3
animals	birds	Sturnidae	*Sturnus vulgaris*	common starling	Y			51
animals	birds	Sturnidae	*Acridotheres tristis*	common myna	Y			8
animals	birds	Sulidae	*Morus serrator*	Australasian gannet		C		2/1
animals	birds	Sylviidae	*Cisticola exilis*	golden-headed cisticola		C		59
animals	birds	Sylviidae	*Cincloramphus mathewsi*	rufous songlark		C		7
animals	birds	Sylviidae	*Acrocephalus stentoreus*	clamorous reed-warbler		C		27
animals	birds	Sylviidae	*Cincloramphus cruralis*	brown songlark		C		7

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Sylviidae	*Megalurus gramineus*	little grassbird		C		9
animals	birds	Sylviidae	*Megalurus timoriensis*	tawny grassbird		C		44
animals	birds	Threskiornithidae	*Platalea regia*	royal spoonbill		C		128
animals	birds	Threskiornithidae	*Platalea flavipes*	yellow-billed spoonbill		C		36
animals	birds	Threskiornithidae	*Threskiornis molucca*	Australian white ibis		C		176
animals	birds	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis		C		147
animals	birds	Threskiornithidae	*Plegadis falcinellus*	glossy ibis		C		43
animals	birds	Turnicidae	*Turnix varia*	painted button-quail		C		14
animals	birds	Turnicidae	*Turnix maculosa*	red-backed button-quail		C		9
animals	birds	Tytonidae	*Tyto alba*	barn owl		C		11
animals	birds	Tytonidae	*Tyto novaehollandiae novaehollandiae*	masked owl (southern subspecies)		C		1
animals	birds	Zosteropidae	*Zosterops lateralis*	silvereye		C		149
animals	birds	Zosteropidae	*Zosterops lateralis cornwalli*	silvereye (eastern)		C		2
animals	bony fish	Ceratodontidae	*Neoceratodus forsteri*	Australian lungfish			V	1
animals	bony fish	Nannopercidae	*Nannoperca oxleyana*	Oxleyan pygmy perch		V	E	1
animals	bony fish	Poeciliidae	*Xiphophorus sp.*					3
animals	insects	Hesperiidae	*Cephrenes sp.*					1
animals	insects	Hesperiidae	*Chaetocneme beata*	eastern dusk-flat				1
animals	insects	Hesperiidae	*Trapezites symmomus*					1
animals	insects	Hesperiidae	*Telicota colon argeus*	pale-orange darter				6
animals	insects	Hesperiidae	*Cephrenes trichopepla*	yellow palm-dart				25
animals	insects	Hesperiidae	*Pelopidas agna dingo*	dingy swift				1
animals	insects	Hesperiidae	*Suniana sunias nola*	wide-brand grass-dart (southern subspecies)				1
animals	insects	Hesperiidae	*Hasora discolor mastusia*	green awl				1
animals	insects	Hesperiidae	*Ocybadistes ardea heterobathra*	orange grass-dart				37
animals	insects	Hesperiidae	*Euschemon rafflesia rafflesia*	regent skipper (southern subspecies)				10
animals	insects	Hesperiidae	*Taractrocera papyria papyria*	white-banded grass-dart				4
animals	insects	Hesperiidae	*Cephrenes augiades sperthias*	orange palm-dart				2
animals	insects	Hesperiidae	*Ocybadistes walkeri sothis*	green grass-dart (Bassian subspecies)				1
animals	insects	Hesperiidae	*Telicota ancilla ancilla*	green darter				2
animals	insects	Lycaenidae	*Prosotas felderi*	southern line-blue				3
animals	insects	Lycaenidae	*Zizeeria karsandra*	spotted grass-blue				12
animals	insects	Lycaenidae	*Psychonotis caelius*	small green-banded blue				2
animals	insects	Lycaenidae	*Lampides boeticus*	long-tailed pea-blue				6
animals	insects	Lycaenidae	*Candalides absimilis*	common pencilled-blue				1
animals	insects	Lycaenidae	*Zizula hylax attenuata*	little grass-blue				13
animals	insects	Lycaenidae	*Zizina labradus labradus*	common grass-blue (Australian subspecies)				52
animals	insects	Lycaenidae	*Erysichton lineata lineata*	hairy line-blue				1
animals	insects	Lycaenidae	*Catochrysops panormus platissa*	pale pea-blue				1
animals	insects	Lycaenidae	*Nacaduba berenice berenice*	large purple line-blue				5
animals	insects	Lycaenidae	*Catopyrops florinda halys*	speckled line-blue (southern subspecies)				1
animals	insects	Lycaenidae	*Candalides erinus erinus*	small dusky-blue				1
animals	insects	Lycaenidae	*Rapala varuna simsoni*	indigo flash				4

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	insects	Nymphalidae	*Euploea sp.*					2
animals	insects	Nymphalidae	*Hypocysta metirius*	brown ringlet				7
animals	insects	Nymphalidae	*Hypolimnas misippus*	danaid eggfly				1
animals	insects	Nymphalidae	*Danaus plexippus plexippus*	monarch				87
animals	insects	Nymphalidae	*Danaus chrysippus petilia*	lesser wanderer				54
animals	insects	Nymphalidae	*Hypolimnas bolina nerina*	varied eggfly				53
animals	insects	Nymphalidae	*Tirumala hamata hamata*	blue tiger				40
animals	insects	Nymphalidae	*Junonia villida calybe*	meadow argus				56
animals	insects	Nymphalidae	*Danaus affinis affinis*	marsh tiger				9
animals	insects	Nymphalidae	*Melanitis leda bankia*	common evening-brown				69
animals	insects	Nymphalidae	*Hypocysta pseudirius*	grey ringlet				1
animals	insects	Nymphalidae	*Euploea core corinna*	common crow				63
animals	insects	Nymphalidae	*Doleschallia bisaltide australis*	leafwing				1
animals	insects	Nymphalidae	*Polyura sempronius sempronius*	tailed emperor				36
animals	insects	Nymphalidae	*Argyreus hyperbius inconstans*	Australian fritillary		E		10
animals	insects	Nymphalidae	*Phaedyma shepherdi shepherdi*	white-banded plane (southern subspecies)				11
animals	insects	Nymphalidae	*Acraea andromacha andromacha*	glasswing				49
animals	insects	Nymphalidae	*Junonia orithya albicincta*	blue argus				1
animals	insects	Nymphalidae	*Phaedyma shepherdi*					1
animals	insects	Nymphalidae	*Vanessa kershawi*	Australian painted lady				24
animals	insects	Nymphalidae	*Vanessa itea*	yellow admiral				16
animals	insects	Papilionidae	*Papilio aegeus aegeus*	orchard swallowtail (Australian subspecies)				45
animals	insects	Papilionidae	*Cressida cressida cressida*	greasy swallowtail				28
animals	insects	Papilionidae	*Papilio demoleus sthenelus*	chequered swallowtail				18
animals	insects	Papilionidae	*Graphium sarpedon choredon*	blue triangle				38
animals	insects	Papilionidae	*Graphium eurypylus lycaon*	pale-blue triangle (eastern subspecies)				18
animals	insects	Papilionidae	*Papilio anactus*	dingy swallowtail				18
animals	insects	Papilionidae	*Papilio aegeus*					1
animals	insects	Papilionidae	*Papilio fuscus capaneus*	fuscous swallowtail (Australian subspecies)				19
animals	insects	Pieridae	*Pieris rapae*	cabbage white				43
animals	insects	Pieridae	*Elodina parthia*	striated pearl-white				1
animals	insects	Pieridae	*Appias paulina ego*	yellow albatross				2
animals	insects	Pieridae	*Delias nigrina*	black jezebel				58
animals	insects	Pieridae	*Eurema smilax*	small grass-yellow				23
animals	insects	Pieridae	*Elodina angulipennis*	southern pearl-white				2
animals	insects	Pieridae	*Belenois java teutonia*	caper white				11
animals	insects	Pieridae	*Catopsilia gorgophone gorgophone*	yellow migrant				1
animals	insects	Pieridae	*Delias argenthona argenthona*	scarlet jezebel				51
animals	insects	Pieridae	*Catopsilia pyranthe crokera*	white migrant				18
animals	insects	Pieridae	*Eurema brigitta australis*	no-brand grass-yellow				8
animals	insects	Pieridae	*Cepora perimale scyllara*	caper gull (Australian subspecies)				8
animals	insects	Pieridae	*Catopsilia pomona pomona*	lemon migrant				54

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	insects	Pieridae	*Eurema hecabe phoebus*	large grass-yellow				46
animals	mammals	Bovidae	*Bos taurus*	European cattle	Y			1
animals	mammals	Canidae	*Vulpes vulpes*	red fox	Y			15
animals	mammals	Canidae	*Canis familiaris*	dog	Y			1
animals	mammals	Canidae	*Canis lupus dingo*	dingo				14
animals	mammals	Dasyuridae	*Planigale maculata*	common planigale		C		1
animals	mammals	Dasyuridae	*Antechinus flavipes*	yellow-footed antechinus		C		6/1
animals	mammals	Dasyuridae	*Antechinus flavipes flavipes*	yellow-footed antechinus (south-east Queensland)		C		17
animals	mammals	Delphinidae	*Tursiops truncatus*	bottlenose dolphin		C		1
animals	mammals	Dugongidae	*Dugong dugon*	dugong		V		1
animals	mammals	Felidae	*Felis catus*	cat	Y			8
animals	mammals	Leporidae	*Lepus capensis*	brown hare	Y			20
animals	mammals	Macropodidae	*Macropus sp.*					4
animals	mammals	Macropodidae	*Wallabia bicolor*	swamp wallaby		C		16/1
animals	mammals	Macropodidae	*Macropus giganteus*	eastern grey kangaroo		C		34
animals	mammals	Macropodidae	*Macropus rufogriseus*	red-necked wallaby		C		15
animals	mammals	Macropodidae	*Macropus dorsalis*	black-striped wallaby		C		7
animals	mammals	Macropodidae	*Macropus parryi*	whiptail wallaby		C		2
animals	mammals	Molossidae	*Mormopterus sp. 2*	eastern freetail bat		C		2
animals	mammals	Molossidae	*Tadarida australis*	white-striped freetail bat		C		9
animals	mammals	Molossidae	*Mormopterus beccarii*	Beccari's freetail bat		C		1
animals	mammals	Muridae	*Melomys sp.*					11
animals	mammals	Muridae	*Rattus lutreolus*	swamp rat		C		11
animals	mammals	Muridae	*Hydromys chrysogaster*	water rat		C		10
animals	mammals	Muridae	*Melomys cervinipes*	fawn-footed melomys		C		5
animals	mammals	Muridae	*Rattus fuscipes*	bush rat		C		13
animals	mammals	Muridae	*Mus musculus*	house mouse	Y			24
animals	mammals	Muridae	*Melomys burtoni*	grassland melomys		C		5
animals	mammals	Muridae	*Rattus rattus*	black rat	Y			5
animals	mammals	Ornithorhynchidae	*Ornithorhynchus anatinus*	platypus		C		35
animals	mammals	Peramelidae	*Isoodon macrourus*	northern brown bandicoot		C		9
animals	mammals	Petauridae	*Petaurus sp.*					1
animals	mammals	Petauridae	*Petaurus breviceps*	sugar glider		C		4
animals	mammals	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum		C		32/1
animals	mammals	Phascolarctidae	*Phascolarctos cinereus (southeast Queensland bioregion)*	koala (southeast Queensland bioregion)		V		179/1
animals	mammals	Potoroidae	*Aepyprymnus rufescens*	rufous bettong		C		2
animals	mammals	Pseudocheiridae	*Petauroides volans*	greater glider		C		10/1
animals	mammals	Pseudocheiridae	*Pseudocheirus peregrinus*	common ringtail possum		C		21/1
animals	mammals	Pteropodidae	*Pteropus sp.*					12
animals	mammals	Pteropodidae	*Pteropus alecto*	black flying-fox		C		2
animals	mammals	Pteropodidae	*Pteropus poliocephalus*	grey-headed flying-fox		C	V	22
animals	mammals	Pteropodidae	*Pteropus scapulatus*	little red flying-fox		C		4
animals	mammals	Rhinolophidae	*Rhinolophus megaphyllus*	eastern horseshoe-bat		C		2
animals	mammals	Suidae	*Sus scrofa*	pig	Y			15

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	mammals	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna		C		19
animals	mammals	Vespertilionidae	*Myotis macropus*	large-footed myotis		C		2
animals	mammals	Vespertilionidae	*Miniopterus schreibersii oceanensis*	eastern bent-wing bat		C		3
animals	mammals	Vespertilionidae	*Chalinolobus nigrogriseus*	hoary wattled bat		C		2
animals	mammals	Vespertilionidae	*Nyctophilus sp.*					1
animals	mammals	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat		C		2
animals	mammals	Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat		C		2
animals	reptiles	Agamidae	*Pogona barbata*	bearded dragon		C		30
animals	reptiles	Agamidae	*Diporiphora australis*			C		4
animals	reptiles	Agamidae	*Amphibolurus nobbi nobbi*	nobbi		C		2
animals	reptiles	Agamidae	*Physignathus lesueurii*	eastern water dragon		C		19
animals	reptiles	Agamidae	*Chlamydosaurus kingii*	frilled lizard		C		2
animals	reptiles	Boidae	*Morelia spilota*	carpet python		C		22/2
animals	reptiles	Chelidae	*Emydura sp.*					1
animals	reptiles	Chelidae	*Chelodina longicollis*	eastern snake-necked turtle		C		4
animals	reptiles	Colubridae	*Boiga irregularis*	brown tree snake		C		4
animals	reptiles	Colubridae	*Tropidonophis mairii*	freshwater snake		C		9
animals	reptiles	Colubridae	*Dendrelaphis punctulata*	common tree snake		C		13
animals	reptiles	Elapidae	*Cacophis krefftii*	dwarf crowned snake		C		1
animals	reptiles	Elapidae	*Hemiaspis signata*	black-bellied swamp snake		C		4
animals	reptiles	Elapidae	*Demansia psammophis*	yellow-faced whip snake		C		8
animals	reptiles	Elapidae	*Pseudechis porphyriacus*	red-bellied black snake		C		9
animals	reptiles	Elapidae	*Tropidechis carinatus*	rough-scaled snake		C		1
animals	reptiles	Elapidae	*Cacophis squamulosus*	golden crowned snake		C		5
animals	reptiles	Elapidae	*Cacophis harriettae*	white-crowned snake		C		4/1
animals	reptiles	Elapidae	*Rhinoplocephalus nigrescens*	eastern small-eyed snake		C		1
animals	reptiles	Gekkonidae	*Gehyra dubia*			C		3
animals	reptiles	Gekkonidae	*Oedura lesueurii*	Lesueur's velvet gecko		C		1
animals	reptiles	Gekkonidae	*Oedura robusta*	robust velvet gecko		C		3/1
animals	reptiles	Pygopodidae	*Delma plebeia*	common delma		C		1
animals	reptiles	Pygopodidae	*Lialis burtonis*	Burton's legless lizard		C		6/2
animals	reptiles	Scincidae	*Lampropholis amicula*			C		1
animals	reptiles	Scincidae	*Lampropholis couperi*			C		2
animals	reptiles	Scincidae	*Anomalopus verreauxii*			C		4
animals	reptiles	Scincidae	*Ctenotus taeniolatus*	copper-tailed skink		C		1
animals	reptiles	Scincidae	*Tiliqua scincoides*	eastern blue-tongued lizard		C		7
animals	reptiles	Scincidae	*Eulamprus martini*			C		1
animals	reptiles	Scincidae	*Ctenotus robustus*			C		4
animals	reptiles	Scincidae	*Carlia pectoralis*			C		1
animals	reptiles	Scincidae	*Eulamprus quoyii*	eastern water skink		C		7
animals	reptiles	Scincidae	*Egernia frerei*	major skink		C		1
animals	reptiles	Scincidae	*Egernia major*	land mullet		C		2
animals	reptiles	Scincidae	*Carlia vivax*			C		5
animals	reptiles	Scincidae	*Lampropholis delicata*			C		24
animals	reptiles	Scincidae	*Cryptoblepharus virgatus*			C		19
animals	reptiles	Scincidae	*Cyclodomorphus gerrardii*	pink-tongued lizard		C		2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	reptiles	Scincidae	*Saproscincus challengeri*			C		1
animals	reptiles	Typhlopidae	*Ramphotyphlops sp.*					1
animals	reptiles	Typhlopidae	*Ramphotyphlops nigrescens*			C		2
animals	reptiles	Typhlopidae	*Ramphotyphlops proximus*			C		1/1
animals	reptiles	Varanidae	*Varanus sp.*	goanna				2
animals	reptiles	Varanidae	*Varanus varius*	lace monitor		C		14
animals	reptiles	Varanidae	*Varanus gouldii*	sand monitor		C		3/1
fungi	sac fungi	Arthoniaceae	*Arthothelium*			C		1/1
fungi	sac fungi	Collemataceae	*Collema glaucophthalmum*			C		1/1
fungi	sac fungi	Haematommaceae	*Haematomma persoonii*			C		1/1
fungi	sac fungi	Lecanoraceae	*Lecanora argentata*			C		1/1
fungi	sac fungi	Parmeliaceae	*Punctelia borreri*			C		1/1
fungi	sac fungi	Parmeliaceae	*Parmelina conlabrosa*			C		1/1
fungi	sac fungi	Parmeliaceae	*Parmelinopsis spumosa*			C		1/1
fungi	sac fungi	Parmeliaceae	*Parmotrema crinitum x P.reticulatum (Taylor) M.Choisy*			C		1/1
fungi	sac fungi	Parmeliaceae	*Hypotrachyna immaculata*			C		2/2
fungi	sac fungi	Parmeliaceae	*Parmotrema tinctorum*			C		2/2
fungi	sac fungi	Parmeliaceae	*Parmotrema robustum*			C		2/2
fungi	sac fungi	Parmeliaceae	*Canoparmelia texana*			C		1/1
fungi	sac fungi	Parmeliaceae	*Parmotrema crinitum*			C		3/3
fungi	sac fungi	Pertusariaceae	*Pertusaria leioplacella*			C		1/1
fungi	sac fungi	Physciaceae	*Physcia minor*			C		1/1
fungi	sac fungi	Physciaceae	*Hafellia dissa*			C		2/2
fungi	sac fungi	Physciaceae	*Dirinaria picta*			C		3/3
fungi	sac fungi	Physciaceae	*Dirinaria confluens*			C		2/2
fungi	sac fungi	Physciaceae	*Hyperphyscia adglutinata*			C		2/2
fungi	sac fungi	Physciaceae	*Dirinaria applanata*			C		5/5
fungi	sac fungi	Ramalinaceae	*Ramalina confirmata*			C		2/2
fungi	uncertain	Ascomycota	*Hypoxylon nummularium var. australe*			C		1/1
fungi		Basidiomycota	*Hygrocybe miniata*			C		1/1
fungi		Basidiomycota	*Polyporus tumulosus*			C		1/1
fungi		Basidiomycota	*Phallus rubicundus*			C		1/1
fungi		Basidiomycota	*Lycoperdon gunnii*			C		1/1
plants	conifers	Araucariaceae	*Araucaria cunninghamii var. cunninghamii*			C		1/1
plants	conifers	Cupressaceae	*Callitris columellaris*			C		2/1
plants	conifers	Pinaceae	*Pinus elliottii*	slash pine	Y			4/1
plants	cycads	Zamiaceae	*Macrozamia lucida*	pineapple zamia		C		1
plants	ferns	Adiantaceae	*Pellaea nana*			C		1/1
plants	ferns	Adiantaceae	*Adiantum hispidulum*			C		1
plants	ferns	Adiantaceae	*Adiantum aethiopicum*			C		1
plants	ferns	Adiantaceae	*Cheilanthes sieberi subsp. sieberi*			C		2/2
plants	ferns	Adiantaceae	*Adiantum hispidulum var. hispidulum*			C		1/1
plants	ferns	Aspleniaceae	*Asplenium attenuatum var. attenuatum*			C		1/1
plants	ferns	Blechnaceae	*Doodia aspera*	prickly rasp fern		C		1
plants	ferns	Blechnaceae	*Blechnum indicum*	swamp water fern		C		5

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plants	ferns	Dennstaedtiaceae	*Pteridium esculentum*	common bracken		C		5/1
plants	ferns	Lindsaeaceae	*Lindsaea incisa*			C		2
plants	ferns	Lindsaeaceae	*Lindsaea ensifolia subsp. ensifolia*			C		1
plants	ferns	Polypodiaceae	*Drynaria rigidula*			C		1/1
plants	ferns	Schizaeaceae	*Lygodium microphyllum*	snake fern		C		2/1
plants	ferns	Thelypteridaceae	*Christella dentata*	creek fern		C		1/1
plants	higher dicots	Acanthaceae	*Thunbergia alata*	black-eyed Susan	Y			1/1
plants	higher dicots	Acanthaceae	*Hygrophila costata*		Y			3/3
plants	higher dicots	Acanthaceae	*Hygrophila polysperma*		Y			1/1
plants	higher dicots	Acanthaceae	*Rostellularia adscendens subsp. adscendens*			C		1/1
plants	higher dicots	Aizoaceae	*Zaleya galericulata*			C		1/1
plants	higher dicots	Aizoaceae	*Tetragonia tetragonioides*	New Zealand spinach		C		1/1
plants	higher dicots	Aizoaceae	*Sesuvium portulacastrum*	sea purslane		C		1/1
plants	higher dicots	Amaranthaceae	*Gomphrena celosioides*	gomphrena weed	Y			1/1
plants	higher dicots	Anacardiaceae	*Schinus terebinthifolius*		Y			2
plants	higher dicots	Apiaceae	*Centella asiatica*			C		3/1
plants	higher dicots	Apiaceae	*Hydrocotyle paludosa*			C		1/1
plants	higher dicots	Apocynaceae	*Parsonsia velutina*	hairy silkpod		C		1
plants	higher dicots	Apocynaceae	*Alyxia ruscifolia*			C		1
plants	higher dicots	Apocynaceae	*Parsonsia straminea*	monkey rope		C		4/1
plants	higher dicots	Araliaceae	*Polyscias elegans*	celery wood		C		2
plants	higher dicots	Asclepiadaceae	*Cynanchum carnosum*			C		1/1
plants	higher dicots	Asteraceae	*Bidens pilosa*		Y			1
plants	higher dicots	Asteraceae	*Aster subulatus*	wild aster	Y			2/1
plants	higher dicots	Asteraceae	*Sonchus oleraceus*	common sowthistle	Y			1
plants	higher dicots	Asteraceae	*Emilia sonchifolia*		Y			1
plants	higher dicots	Asteraceae	*Glossocardia bidens*	native cobbler's pegs		C		1/1
plants	higher dicots	Asteraceae	*Arctotheca calendula*	Cape weed	Y			1/1
plants	higher dicots	Asteraceae	*Ageratum houstonianum*	blue billygoat weed	Y			1
plants	higher dicots	Asteraceae	*Cyanthillium cinereum*			C		1/1
plants	higher dicots	Asteraceae	*Erechtites valerianifolius forma valerianifolius*		Y			1/1
plants	higher dicots	Asteraceae	*Conyza canadensis var. canadensis*		Y			1/1
plants	higher dicots	Asteraceae	*Sphagneticola trilobata*		Y			1/1
plants	higher dicots	Asteraceae	*Baccharis halimifolia*	groundsel bush	Y			8/1
plants	higher dicots	Asteraceae	*Hypochaeris radicata*	catsear	Y			1/1
plants	higher dicots	Asteraceae	*Ageratina adenophora*	crofton weed	Y			1/1
plants	higher dicots	Asteraceae	*Conyza primulifolia*	Chilean fleabane	Y			1/1
plants	higher dicots	Asteraceae	*Conyza bonariensis*		Y			1
plants	higher dicots	Asteraceae	*Tagetes minuta*	stinking roger	Y			1/1
plants	higher dicots	Basellaceae	*Anredera cordifolia*	Madeira vine	Y			1/1
plants	higher dicots	Boraginaceae	*Heliotropium amplexicaule*	blue heliotrope	Y			1/1
plants	higher dicots	Brassicaceae	*Lepidium bonariense*	Argentine peppercress	Y			1/1
plants	higher dicots	Caesalpiniaceae	*Senna didymobotrya*		Y			1/1
plants	higher dicots	Caesalpiniaceae	*Chamaecrista rotundifolia var. rotundifolia*		Y			3/2
plants	higher dicots	Caesalpiniaceae	*Senna pendula var. glabrata*	Easter cassia	Y			1
plants	higher dicots	Campanulaceae	*Pratia concolor*	poison pratia		C		1

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plants	higher dicots	Campanulaceae	*Lobelia stenophylla*			C		1/1
plants	higher dicots	Campanulaceae	*Lobelia purpurascens*	white root		C		3
plants	higher dicots	Casuarinaceae	*Casuarina glauca*	swamp she-oak		C		5
plants	higher dicots	Casuarinaceae	*Allocasuarina littoralis*			C		2/2
plants	higher dicots	Casuarinaceae	*Casuarina cunninghamiana*			C		1
plants	higher dicots	Casuarinaceae	*Allocasuarina torulosa*			C		1
plants	higher dicots	Celastraceae	*Siphonodon australis*	ivorywood		C		2/2
plants	higher dicots	Chenopodiaceae	*Suaeda australis*			C		6/1
plants	higher dicots	Chenopodiaceae	*Enchylaena tomentosa var. glabra*			C		1
plants	higher dicots	Chenopodiaceae	*Suaeda arbusculoides*			C		5/1
plants	higher dicots	Chenopodiaceae	*Sarcocornia quinqueflora subsp. quinqueflora*			C		4
plants	higher dicots	Chenopodiaceae	*Halosarcia pergranulata subsp. queenslandica*			C		1/1
plants	higher dicots	Clusiaceae	*Hypericum gramineum*			C		1/1
plants	higher dicots	Convolvulaceae	*Ipomoea cairica*		Y			2
plants	higher dicots	Convolvulaceae	*Ipomoea plebeia*	bellvine		C		1/1
plants	higher dicots	Cunoniaceae	*Callicoma serratifolia*	callicoma		C		1/1
plants	higher dicots	Dilleniaceae	*Hibbertia stricta*			C		2
plants	higher dicots	Dilleniaceae	*Hibbertia stricta var. stricta*			C		1/1
plants	higher dicots	Dilleniaceae	*Hibbertia vestita var. vestita*			C		1/1
plants	higher dicots	Dilleniaceae	*Hibbertia vestita*			C		2
plants	higher dicots	Droseraceae	*Drosera lanata*			C		1
plants	higher dicots	Ebenaceae	*Diospyros fasciculosa*	grey ebony		C		1
plants	higher dicots	Elaeocarpaceae	*Elaeocarpus coorangooloo*			R		1
plants	higher dicots	Epacridaceae	*Monotoca scoparia*	prickly broom heath		C		1/1
plants	higher dicots	Epacridaceae	*Acrotriche aggregata*	red cluster heath		C		1/1
plants	higher dicots	Epacridaceae	*Epacris microphylla*			C		1
plants	higher dicots	Euphorbiaceae	*Acalypha nemorum*	hairy acalypha		C		1
plants	higher dicots	Euphorbiaceae	*Acalypha australis*		Y			2/2
plants	higher dicots	Euphorbiaceae	*Euphorbia peplus*	petty spurge	Y			1/1
plants	higher dicots	Euphorbiaceae	*Drypetes deplanchei*	grey boxwood		C		1
plants	higher dicots	Euphorbiaceae	*Phyllanthus tenellus*		Y			2/2
plants	higher dicots	Euphorbiaceae	*Bridelia leichhardtii*			C		1
plants	higher dicots	Euphorbiaceae	*Glochidion harveyanum*			C		1
plants	higher dicots	Euphorbiaceae	*Ricinocarpos pinifolius*	wedding bush		C		2/1
plants	higher dicots	Euphorbiaceae	*Chamaesyce hyssopifolia*		Y			2/2
plants	higher dicots	Euphorbiaceae	*Poranthera microphylla*	small poranthera		C		1
plants	higher dicots	Euphorbiaceae	*Euphorbia heterophylla*		Y			2/2
plants	higher dicots	Euphorbiaceae	*Mallotus philippensis*	red kamala		C		1
plants	higher dicots	Euphorbiaceae	*Mallotus claoxyloides*	green kamala		C		1
plants	higher dicots	Euphorbiaceae	*Glochidion sumatranum*	umbrella cheese tree		C		2
plants	higher dicots	Euphorbiaceae	*Glochidion ferdinandi*			C		3/1
plants	higher dicots	Euphorbiaceae	*Phyllanthus virgatus*			C		1/1
plants	higher dicots	Euphorbiaceae	*Breynia oblongifolia*			C		1
plants	higher dicots	Fabaceae	*Kennedia rubicunda*	red Kennedy pea		C		1/1
plants	higher dicots	Fabaceae	*Kummerowia striata*	japanese clover	Y			1/1
plants	higher dicots	Fabaceae	*Lotononis bainesii*	lotononis	Y			3/3

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plants	higher dicots	Fabaceae	*Pultenaea paleacea*			C		2
plants	higher dicots	Fabaceae	*Mirbelia rubiifolia*	heathy mirbelia		C		2/2
plants	higher dicots	Fabaceae	*Pycnospora lutescens*	pycnospora		C		1/1
plants	higher dicots	Fabaceae	*Derris involuta*	native derris		C		1
plants	higher dicots	Fabaceae	*Aotus lanigera*	pointed aotus		C		1/1
plants	higher dicots	Fabaceae	*Fabaceae*			C		1
plants	higher dicots	Fabaceae	*Desmodium heterocarpon var. heterocarpon*			C		1/1
plants	higher dicots	Fabaceae	*Daviesia ulicifolia subsp. stenophylla*			C		1/1
plants	higher dicots	Fabaceae	*Austrosteenisia blackii var. blackii*			C		1/1
plants	higher dicots	Fabaceae	*Zornia dyctiocarpa var. dyctiocarpa*			C		1/1
plants	higher dicots	Fabaceae	*Trifolium repens var. repens*	white clover	Y			1/1
plants	higher dicots	Fabaceae	*Macroptilium atropurpureum*	siratro	Y			1/1
plants	higher dicots	Fabaceae	*Jacksonia scoparia*			C		2/2
plants	higher dicots	Fabaceae	*Pultenaea villosa*	hairy bush pea		C		1/1
plants	higher dicots	Fabaceae	*Glycine cyrtoloba*			C		1
plants	higher dicots	Fabaceae	*Pultenaea retusa*			C		1/1
plants	higher dicots	Fabaceae	*Mirbelia pungens*			C		2/2
plants	higher dicots	Fabaceae	*Mucuna gigantea*	burny bean		C		1/1
plants	higher dicots	Fabaceae	*Vicia sativa subsp. nigra*		Y			1/1
plants	higher dicots	Fabaceae	*Tephrosia glomeruliflora*	pink tephrosia	Y			1/1
plants	higher dicots	Fabaceae	*Desmodium rhytidophyllum*			C		2
plants	higher dicots	Fabaceae	*Stylosanthes guianensis*		Y			1/1
plants	higher dicots	Fabaceae	*Indigofera suffruticosa*		Y			1/1
plants	higher dicots	Fabaceae	*Hardenbergia violacea*			C		2
plants	higher dicots	Fabaceae	*Gompholobium pinnatum*	poor mans gold		C		1/1
plants	higher dicots	Fabaceae	*Chorizema parviflorum*	eastern flame pea		C		2/2
plants	higher dicots	Fabaceae	*Pultenaea myrtoides*			C		2/2
plants	higher dicots	Fabaceae	*Glycine clandestina*			C		1
plants	higher dicots	Goodeniaceae	*Velleia spathulata*	wild pansies		C		3/2
plants	higher dicots	Goodeniaceae	*Goodenia rotundifolia*			C		1/1
plants	higher dicots	Haloragaceae	*Gonocarpus chinensis subsp. verrucosus*			C		2/2
plants	higher dicots	Haloragaceae	*Gonocarpus micranthus subsp. ramosissimus*			C		1
plants	higher dicots	Lamiaceae	*Lycopus australis*	water horehound		C		1/1
plants	higher dicots	Lamiaceae	*Westringia eremicola*	slender westringia		C		1/1
plants	higher dicots	Lamiaceae	*Plectranthus graveolens*	flea bush		C		1/1
plants	higher dicots	Lamiaceae	*Clerodendrum floribundum*			C		1
plants	higher dicots	Lamiaceae	*Clerodendrum tomentosum*			C		1
plants	higher dicots	Lentibulariaceae	*Utricularia aurea*	golden bladderwort		C		4/4
plants	higher dicots	Lentibulariaceae	*Utricularia lasiocaulis*			C		1/1
plants	higher dicots	Lentibulariaceae	*Utricularia caerulea*	blue bladderwort		C		1/1
plants	higher dicots	Lentibulariaceae	*Utricularia uliginosa*	asian bladderwort		C		1/1
plants	higher dicots	Malvaceae	*Sida cordifolia*		Y			1
plants	higher dicots	Malvaceae	*Hibiscus heterophyllus*			C		3/1
plants	higher dicots	Malvaceae	*Malvaviscus arboreus*		Y			1/1
plants	higher dicots	Malvaceae	*Sida rhombifolia*		Y			1/1
plants	higher dicots	Malvaceae	*Hibiscus tiliaceus*	cotton tree		C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Melastomataceae	*Melastoma malabathricum subsp. malabathricum*			C		2
plants	higher dicots	Meliaceae	*Dysoxylum rufum*			C		1
plants	higher dicots	Meliaceae	*Melia azedarach*	white cedar		C		2
plants	higher dicots	Menyanthaceae	*Nymphoides indica*	water snowflake		C		1/1
plants	higher dicots	Mimosaceae	*Acacia maidenii*	Maiden's wattle		C		2
plants	higher dicots	Mimosaceae	*Acacia leiocalyx subsp. leiocalyx*			C		2/2
plants	higher dicots	Mimosaceae	*Acacia penninervis*			C		1
plants	higher dicots	Mimosaceae	*Acacia concurrens*			C		4/3
plants	higher dicots	Mimosaceae	*Acacia flavescens*	toothed wattle		C		1
plants	higher dicots	Mimosaceae	*Acacia myrtifolia*			C		1/1
plants	higher dicots	Mimosaceae	*Acacia hubbardiana*			C		1/1
plants	higher dicots	Mimosaceae	*Acacia aulacocarpa*			C		2
plants	higher dicots	Mimosaceae	*Acacia cincinnata*			C		1/1
plants	higher dicots	Mimosaceae	*Acacia leiocalyx*			C		5
plants	higher dicots	Moraceae	*Ficus virens*			C		1
plants	higher dicots	Moraceae	*Maclura cochinchinensis*	cockspur thorn		C		1
plants	higher dicots	Moraceae	*Trophis scandens subsp. scandens*			C		1
plants	higher dicots	Moraceae	*Ficus obliqua*			C		1
plants	higher dicots	Moraceae	*Ficus coronata*	creek sandpaper fig		C		1
plants	higher dicots	Myrsinaceae	*Myrsine porosa*			C		1
plants	higher dicots	Myrsinaceae	*Myrsine variabilis*			C		1
plants	higher dicots	Myrsinaceae	*Aegiceras corniculatum*	river mangrove		C		3
plants	higher dicots	Myrtaceae	*Melaleuca quinquenervia*	swamp paperbark		C		8
plants	higher dicots	Myrtaceae	*Leptospermum juniperinum*	prickly tea-tree		C		1
plants	higher dicots	Myrtaceae	*Leptospermum microcarpum*	small-fruited tea-tree		C		2/2
plants	higher dicots	Myrtaceae	*Leptospermum polygalifolium*	tantoon		C		3/1
plants	higher dicots	Myrtaceae	*Corymbia trachyphloia subsp. trachyphloia*			C		1
plants	higher dicots	Myrtaceae	*Eucalyptus racemosa subsp. racemosa*	scribbly gum		C		3
plants	higher dicots	Myrtaceae	*Leptospermum luehmannii*			R		2/2
plants	higher dicots	Myrtaceae	*Eucalyptus tereticornis*			C		3
plants	higher dicots	Myrtaceae	*Eucalyptus siderophloia*			C		2
plants	higher dicots	Myrtaceae	*Melaleuca linariifolia*	snow-in summer		C		1
plants	higher dicots	Myrtaceae	*Lophostemon suaveolens*	swamp box		C		5
plants	higher dicots	Myrtaceae	*Leptospermum speciosum*			C		2/1
plants	higher dicots	Myrtaceae	*Lophostemon confertus*	brush box		C		3
plants	higher dicots	Myrtaceae	*Eucalyptus microcorys*			C		1
plants	higher dicots	Myrtaceae	*Eucalyptus bancroftii*	Bancroft's red gum		C		3/1
plants	higher dicots	Myrtaceae	*Melaleuca thymifolia*	thyme honeymyrtle		C		1
plants	higher dicots	Myrtaceae	*Eucalyptus pilularis*	blackbutt		C		1
plants	higher dicots	Myrtaceae	*Melaleuca viminalis*			C		1
plants	higher dicots	Myrtaceae	*Corymbia intermedia*	pink bloodwood		C		4/1
plants	higher dicots	Myrtaceae	*Angophora woodsiana*	smudgee		C		1
plants	higher dicots	Myrtaceae	*Rhodamnia dumicola*	rib-fruited malletwood		C		1/1
plants	higher dicots	Myrtaceae	*Melaleuca salicina*			C		1/1
plants	higher dicots	Myrtaceae	*Calytrix tetragona*	fringe myrtle		C		2/2
plants	higher dicots	Myrtaceae	*Syzygium australe*	scrub cherry		C		3

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Myrtaceae	*Melaleuca sieberi*			C		2/1
plants	higher dicots	Myrtaceae	*Eucalyptus crebra*	narrow-leaved red ironbark		C		1
plants	higher dicots	Myrtaceae	*Angophora costata*			C		1
plants	higher dicots	Myrtaceae	*Acmena hemilampra*			C		1
plants	higher dicots	Myrtaceae	*Syzygium oleosum*	blue cherry		C		1
plants	higher dicots	Myrtaceae	*Melaleuca nodosa*			C		1/1
plants	higher dicots	Myrtaceae	*Gossia bidwillii*			C		1/1
plants	higher dicots	Myrtaceae	*Eugenia uniflora*	Brazilian cherry tree	Y			1
plants	higher dicots	Ochnaceae	*Ochna serrulata*	ochna	Y			1/1
plants	higher dicots	Oleaceae	*Notelaea longifolia*			C		2
plants	higher dicots	Onagraceae	*Ludwigia octovalvis*	willow primrose		C		1/1
plants	higher dicots	Onagraceae	*Ludwigia peploides subsp. montevidensis*			C		1/1
plants	higher dicots	Onagraceae	*Oenothera indecora subsp. bonariensis*		Y			1/1
plants	higher dicots	Oxalidaceae	*Oxalis corniculata*		Y			1
plants	higher dicots	Passifloraceae	*Passiflora foetida*		Y			1/1
plants	higher dicots	Passifloraceae	*Passiflora suberosa*	corky passion flower	Y			2
plants	higher dicots	Passifloraceae	*Passiflora subpeltata*	white passion flower	Y			1
plants	higher dicots	Phytolaccaceae	*Phytolacca octandra*	inkweed	Y			1/1
plants	higher dicots	Pittosporaceae	*Billardiera scandens*			C		1
plants	higher dicots	Pittosporaceae	*Pittosporum revolutum*	yellow pittosporum		C		1
plants	higher dicots	Polygalaceae	*Polygala paniculata*		Y			1/1
plants	higher dicots	Polygalaceae	*Comesperma hispidulum*			C		1/1
plants	higher dicots	Polygonaceae	*Rumex brownii*	swamp dock		C		1/1
plants	higher dicots	Polygonaceae	*Persicaria attenuata*			C		3/3
plants	higher dicots	Polygonaceae	*Persicaria dichotoma*			C		3/3
plants	higher dicots	Polygonaceae	*Persicaria subsessilis*	hairy knotweed		C		1/1
plants	higher dicots	Polygonaceae	*Persicaria orientalis*	princes feathers		C		1/1
plants	higher dicots	Polygonaceae	*Persicaria decipiens*	slender knotweed		C		1/1
plants	higher dicots	Polygonaceae	*Persicaria strigosa*			C		1
plants	higher dicots	Polygonaceae	*Rumex crispus*	curled dock	Y			1/1
plants	higher dicots	Primulaceae	*Anagallis arvensis*	blue pimpernel	Y			1/1
plants	higher dicots	Proteaceae	*Banksia robur*	broad-leaved banksia		C		2
plants	higher dicots	Proteaceae	*Banksia oblongifolia*	dwarf banksia		C		2/1
plants	higher dicots	Proteaceae	*Banksia integrifolia subsp. compar*			C		1/1
plants	higher dicots	Proteaceae	*Persoonia stradbrokensis*			C		3
plants	higher dicots	Proteaceae	*Macadamia integrifolia*	macadamia nut		V	V	1/1
plants	higher dicots	Proteaceae	*Macadamia ternifolia*	bopple nut		V	V	1/1
plants	higher dicots	Proteaceae	*Grevillea leiophylla*	wallum grevillea		C		3/1
plants	higher dicots	Proteaceae	*Banksia integrifolia*			C		2
plants	higher dicots	Proteaceae	*Hakea actites*			C		2/1
plants	higher dicots	Proteaceae	*Grevillea robusta*			C		1
plants	higher dicots	Proteaceae	*Persoonia sericea*	silky geebung		C		1
plants	higher dicots	Proteaceae	*Lomatia silaifolia*	crinkle bush		C		2
plants	higher dicots	Proteaceae	*Hakea florulenta*	three-nerved willow hakea		C		2/1
plants	higher dicots	Rhamnaceae	*Alphitonia excelsa*	soap tree		C		11/1
plants	higher dicots	Rhizophoraceae	*Ceriops tagal*	yellow mangrove		C		5/3

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plants	higher dicots	Rhizophoraceae	*Rhizophora stylosa*	spotted mangrove		C		4/1
plants	higher dicots	Rhizophoraceae	*Bruguiera gymnorhiza*	large-fruited orange mangrove		C		1/1
plants	higher dicots	Rubiaceae	*Dentella repens*	dentella		C		1/1
plants	higher dicots	Rubiaceae	*Richardia brasiliensis*	white eye	Y			2/2
plants	higher dicots	Rubiaceae	*Cyclophyllum coprosmoides var. coprosmoides*			C		1/1
plants	higher dicots	Rubiaceae	*Everistia vacciniifolia var. nervosa*			C		1/1
plants	higher dicots	Rubiaceae	*Psydrax odorata forma buxifolia*			C		1
plants	higher dicots	Rubiaceae	*Cyclophyllum coprosmoides*			C		1
plants	higher dicots	Rubiaceae	*Psychotria loniceroides*	hairy psychotria		C		1
plants	higher dicots	Rubiaceae	*Pavetta australiensis*			C		1
plants	higher dicots	Rubiaceae	*Morinda canthoides*			C		1/1
plants	higher dicots	Rubiaceae	*Psydrax lamprophylla*			C		1/1
plants	higher dicots	Rubiaceae	*Richardia stellaris*		Y			1/1
plants	higher dicots	Rutaceae	*Zieria smithii*			C		1
plants	higher dicots	Rutaceae	*Halfordia kendack*	saffron heart		C		1
plants	higher dicots	Rutaceae	*Phebalium woombye*	wallum phebalium		C		2/1
plants	higher dicots	Rutaceae	*Boronia polygalifolia*	dwarf boronia		C		1/1
plants	higher dicots	Rutaceae	*Acronychia imperforata*	beach acronychia		C		1
plants	higher dicots	Rutaceae	*Acronychia oblongifolia*	common acronychia		C		1
plants	higher dicots	Rutaceae	*Flindersia bennettiana*	Bennett's ash		C		1
plants	higher dicots	Rutaceae	*Flindersia schottiana*	bumpy ash		C		1
plants	higher dicots	Rutaceae	*Flindersia australis*	crow's ash		C		3/1
plants	higher dicots	Santalaceae	*Exocarpos latifolius*			C		1
plants	higher dicots	Sapindaceae	*Guioa semiglauca*	guioa		C		1
plants	higher dicots	Sapindaceae	*Dodonaea rupicola*			V	V	5/5
plants	higher dicots	Sapindaceae	*Arytera divaricata*	coogera		C		1/1
plants	higher dicots	Sapindaceae	*Jagera pseudorhus var. pseudorhus*			C		1/1
plants	higher dicots	Sapindaceae	*Cupaniopsis anacardioides*	tuckeroo		C		2
plants	higher dicots	Sapindaceae	*Mischocarpus pyriformis*			C		1
plants	higher dicots	Sapindaceae	*Alectryon tomentosus*			C		1
plants	higher dicots	Sapindaceae	*Dodonaea triquetra*	large-leaved hop bush		C		1
plants	higher dicots	Sapindaceae	*Jagera pseudorhus*			C		3
plants	higher dicots	Sapindaceae	*Arytera foveolata*	pitted coogera		C		1/1
plants	higher dicots	Sapotaceae	*Niemeyera antiloga*	brown pearwood		C		1/1
plants	higher dicots	Sapotaceae	*Pouteria pohlmaniana*			C		1
plants	higher dicots	Scrophulariaceae	*Bacopa caroliniana*		Y			1/1
plants	higher dicots	Scrophulariaceae	*Limnophila aromatica*			C		1/1
plants	higher dicots	Scrophulariaceae	*Buchnera urticifolia*			C		1/1
plants	higher dicots	Solanaceae	*Datura metel*		Y			1/1
plants	higher dicots	Solanaceae	*Solanum nigrum*		Y			1
plants	higher dicots	Solanaceae	*Solanum torvum*	devil's fig	Y			4/2
plants	higher dicots	Solanaceae	*Solanum mauritianum*	wild tobacco	Y			2
plants	higher dicots	Solanaceae	*Duboisia myoporoides*			C		1
plants	higher dicots	Solanaceae	*Solanum seaforthianum*	Brazilian nightshade	Y			1
plants	higher dicots	Solanaceae	*Solanum americanum subsp. nutans*		Y			1/1
plants	higher dicots	Solanaceae	*Solanum chrysotrichum*		Y			2/2

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plants	higher dicots	Solanaceae	*Solanum stelligerum*	devil's needles		C		1
plants	higher dicots	Solanaceae	*Physalis angulata*		Y			1/1
plants	higher dicots	Sterculiaceae	*Sterculia quadrifida*	peanut tree		C		1
plants	higher dicots	Stylidiaceae	*Stylidium tenerum*			C		1/1
plants	higher dicots	Thymelaeaceae	*Pimelea linifolia*			C		3
plants	higher dicots	Ulmaceae	*Trema tomentosa var. aspera*			C		1/1
plants	higher dicots	Ulmaceae	*Trema tomentosa var. viridis*			C		3
plants	higher dicots	Verbenaceae	*Lantana camara*		Y			3
plants	higher dicots	Verbenaceae	*Verbena litoralis var. brasiliensis*		Y			1/1
plants	higher dicots	Verbenaceae	*Verbena rigida*		Y			1/1
plants	higher dicots	Verbenaceae	*Lantana camara cv. Gol Gol*		Y			3
plants	higher dicots	Vitaceae	*Cissus opaca*			C		1
plants	liverworts	Cephaloziellaceae	*Cephaloziella*			C		1/1
plants	liverworts	Fossombroniaceae	*Fossombronia*			C		1/1
plants	liverworts	Frullaniaceae	*Frullania*			C		4/4
plants	liverworts	Frullaniaceae	*Frullania subtropica*			C		1/1
plants	liverworts	Frullaniaceae	*Frullania rubella*			C		2/2
plants	liverworts	Frullaniaceae	*Frullania monocera*			C		1/1
plants	liverworts	Frullaniaceae	*Frullania ericoides*			C		2/2
plants	liverworts	Lejeuneaceae	*Lejeunea*			C		2/2
plants	liverworts	Lejeuneaceae	*Lejeunea drummondii*			C		1/1
plants	liverworts	Lejeuneaceae	*Lopholejeunea muelleriana var. australis*			C		1/1
plants	liverworts	Lejeuneaceae	*Acrolejeunea aulacophora*			C		5/5
plants	liverworts	Lejeuneaceae	*Lejeunea caespitosa*			C		2/2
plants	liverworts	Lejeuneaceae	*Lejeunea herzogii*			C		1/1
plants	liverworts	Marchantiaceae	*Marchantia berteroana*			C		1/1
plants	liverworts	Porellaceae	*Porella crawfordii*			C		1/1
plants	lower dicots	Annonaceae	*Melodorum leichhardtii*			C		1/1
plants	lower dicots	Annonaceae	*Polyalthia nitidissima*	polyalthia		C		1
plants	lower dicots	Avicenniaceae	*Avicennia marina subsp. australasica*			C		14/2
plants	lower dicots	Cabombaceae	*Brasenia schreberi*			R		1/1
plants	lower dicots	Cabombaceae	*Cabomba caroliniana var. caroliniana*	Cabomba	Y			4/4
plants	lower dicots	Lauraceae	*Endiandra pubens*	hairy walnut		C		1/1
plants	lower dicots	Lauraceae	*Cassytha glabella*			C		1
plants	lower dicots	Lauraceae	*Endiandra sieberi*	hard corkwood		C		1
plants	lower dicots	Lauraceae	*Cassytha pubescens*	downy devil's twine		C		1
plants	lower dicots	Lauraceae	*Neolitsea dealbata*	white bolly gum		C		1
plants	lower dicots	Menispermaceae	*Pleogyne australis*	wiry grape		C		1
plants	lower dicots	Menispermaceae	*Stephania japonica*			C		2
plants	lower dicots	Nymphaeaceae	*Nymphaea*			C		1/1
plants	monocots	Arecaceae	*Caryota albertii*			C		1
plants	monocots	Arecaceae	*Livistona decora*			C		1
plants	monocots	Asparagaceae	*Asparagus aethiopicus cv. Sprengeri*		Y			2/2
plants	monocots	Burmanniaceae	*Burmannia juncea*			C		1/1
plants	monocots	Colchicaceae	*Gloriosa superba*	glory lily	Y			1/1
plants	monocots	Colchicaceae	*Burchardia umbellata*			C		1

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plants	monocots	Commelinaceae	*Aneilema biflorum*			C		1/1
plants	monocots	Commelinaceae	*Murdannia graminea*	murdannia		C		1/1
plants	monocots	Commelinaceae	*Commelina diffusa*	wandering jew		C		2/1
plants	monocots	Cyperaceae	*Rhynchospora corymbosa*			C		2/2
plants	monocots	Cyperaceae	*Fimbristylis ferruginea*			C		4/1
plants	monocots	Cyperaceae	*Bolboschoenus caldwellii*			C		1
plants	monocots	Cyperaceae	*Fimbristylis bisumbellata*			C		2/1
plants	monocots	Cyperaceae	*Cyperus polystachyos var. polystachyos*			C		1/1
plants	monocots	Cyperaceae	*Lepidosperma laterale var. laterale*			C		1/1
plants	monocots	Cyperaceae	*Cyperus haspan subsp. haspan*			C		1/1
plants	monocots	Cyperaceae	*Fimbristylis polytrichoides*			C		2
plants	monocots	Cyperaceae	*Chorizandra sphaerocephala*			C		1/1
plants	monocots	Cyperaceae	*Schoenoplectus mucronatus*			C		1/1
plants	monocots	Cyperaceae	*Eleocharis philippinensis*			C		1/1
plants	monocots	Cyperaceae	*Fimbristylis tristachya*			C		1/1
plants	monocots	Cyperaceae	*Fimbristylis dichotoma*	common fringe-rush		C		2/2
plants	monocots	Cyperaceae	*Lepidosperma laterale*			C		1
plants	monocots	Cyperaceae	*Eleocharis equisetina*			C		2/1
plants	monocots	Cyperaceae	*Abildgaardia vaginata*			C		1
plants	monocots	Cyperaceae	*Scleria mackaviensis*			C		2/2
plants	monocots	Cyperaceae	*Schoenus yarrabensis*			C		1/1
plants	monocots	Cyperaceae	*Lipocarpha chinensis*			C		1/1
plants	monocots	Cyperaceae	*Lepironia articulata*			C		3/1
plants	monocots	Cyperaceae	*Cyperus sesquiflorus*		Y			1/1
plants	monocots	Cyperaceae	*Cyperus polystachyos*			C		1
plants	monocots	Cyperaceae	*Scleria sphacelata*			C		1
plants	monocots	Cyperaceae	*Rhynchospora rubra*			C		1/1
plants	monocots	Cyperaceae	*Ptilothrix deusta*			C		2/1
plants	monocots	Cyperaceae	*Isolepis inundata*	swamp club rush		C		1/1
plants	monocots	Cyperaceae	*Cyperus trinervis*			C		1/1
plants	monocots	Cyperaceae	*Cyperus bowmannii*			C		1/1
plants	monocots	Cyperaceae	*Baumea rubiginosa*	soft twigrush		C		3/2
plants	monocots	Cyperaceae	*Baumea articulata*	jointed twigrush		C		5/2
plants	monocots	Cyperaceae	*Fuirena ciliaris*			C		1/1
plants	monocots	Cyperaceae	*Cyperus gracilis*			C		1/1
plants	monocots	Cyperaceae	*Cyperus pilosus*			C		2/2
plants	monocots	Cyperaceae	*Scleria rugosa*			C		1/1
plants	monocots	Cyperaceae	*Cyperus fulvus*			C		1/1
plants	monocots	Cyperaceae	*Scleria levis*			C		1/1
plants	monocots	Cyperaceae	*Gahnia aspera*			C		2
plants	monocots	Cyperaceae	*Carex inversa*	knob sedge		C		1/1
plants	monocots	Cyperaceae	*Baumea juncea*	bare twigrush		C		1/1
plants	monocots	Dioscoreaceae	*Dioscorea transversa*	native yam		C		1
plants	monocots	Eriocaulaceae	*Eriocaulon scariosum*			C		1/1
plants	monocots	Haemodoraceae	*Haemodorum tenuifolium*			C		2/2
plants	monocots	Hypoxidaceae	*Curculigo ensifolia var. ensifolia*			C		1/1

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plants	monocots	Iridaceae	*Patersonia glabrata*			C		2/1
plants	monocots	Iridaceae	*Sisyrinchium sp. (Peregian P.R.Sharpe 4970)*	scourweed	Y			1/1
plants	monocots	Iridaceae	*Patersonia sericea var. sericea*			C		1/1
plants	monocots	Juncaceae	*Juncus bufonius*	toad rush	Y			1/1
plants	monocots	Juncaceae	*Juncus kraussii*	sea rush		C		1/1
plants	monocots	Orchidaceae	*Diuris aurea*			C		1/1
plants	monocots	Orchidaceae	*Glossodia minor*	small wax lip orchid		C		1/1
plants	monocots	Orchidaceae	*Phaius australis*			E	E	1/1
plants	monocots	Orchidaceae	*Geodorum densiflorum*	pink nodding orchid		C		2
plants	monocots	Orchidaceae	*Corybas barbarae*	helmet orchid		C		1/1
plants	monocots	Orchidaceae	*Zeuxine oblonga*	hairy jewel orchid		C		1/1
plants	monocots	Orchidaceae	*Arthrochilus prolixus*			C		1/1
plants	monocots	Orchidaceae	*Thelymitra angustifolia*			C		1/1
plants	monocots	Orchidaceae	*Caladenia carnea var. carnea*			C		1/1
plants	monocots	Orchidaceae	*Genoplesium sagittiferum*			C		1/1
plants	monocots	Orchidaceae	*Arthrochilus irritabilis*	leafy elbow orchid		C		2/2
plants	monocots	Orchidaceae	*Genoplesium acuminatum*			C		6/6
plants	monocots	Poaceae	*Isachne globosa*	swamp millet		C		1/1
plants	monocots	Poaceae	*Urochloa mutica*		Y			1/1
plants	monocots	Poaceae	*Leersia hexandra*	swamp rice grass		C		1
plants	monocots	Poaceae	*Themeda triandra*	kangaroo grass		C		4/1
plants	monocots	Poaceae	*Eulalia trispicata*			C		1/1
plants	monocots	Poaceae	*Eragrostis brownii*	Brown's lovegrass		C		1/1
plants	monocots	Poaceae	*Digitaria ciliaris*	summer grass	Y			2/2
plants	monocots	Poaceae	*Bromus catharticus*	prairie grass	Y			1/1
plants	monocots	Poaceae	*Aristida warburgii*			C		1
plants	monocots	Poaceae	*Sorghum halepense*	Johnson grass	Y			1
plants	monocots	Poaceae	*Paspalum urvillei*	vasey grass	Y			1/1
plants	monocots	Poaceae	*Hyparrhenia hirta*	coolati grass	Y			1/1
plants	monocots	Poaceae	*Entolasia stricta*	wiry panic		C		5
plants	monocots	Poaceae	*Entolasia marginata*	bordered panic		C		3
plants	monocots	Poaceae	*Digitaria didactyla*	Queensland blue couch	Y			1/1
plants	monocots	Poaceae	*Aristida gracilipes*			C		1/1
plants	monocots	Poaceae	*Setaria sphacelata*		Y			3/1
plants	monocots	Poaceae	*Sacciolepis indica*	Indian cupscale grass		C		6/3
plants	monocots	Poaceae	*Paspalum vaginatum*	saltwater couch		C		1
plants	monocots	Poaceae	*Paspalum dilatatum*	paspalum	Y			1/1
plants	monocots	Poaceae	*Paspalidium gausum*			C		1
plants	monocots	Poaceae	*Oplismenus aemulus*	creeping shade grass		C		2
plants	monocots	Poaceae	*Eleusine indica*	crowsfoot grass	Y			1/1
plants	monocots	Poaceae	*Melinis repens*	red natal grass	Y			2/2
plants	monocots	Poaceae	*Chloris gayana*	rhodes grass	Y			1/1
plants	monocots	Poaceae	*Chrysopogon sylvaticus*			C		1/1
plants	monocots	Poaceae	*Alloteropsis semialata*	cockatoo grass		C		1/1
plants	monocots	Poaceae	*Sporobolus virginicus*	sand couch		C		6/3
plants	monocots	Poaceae	*Oplismenus imbecillis*			C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	monocots	Poaceae	*Eragrostis atrovirens*		Y			1/1
plants	monocots	Poaceae	*Andropogon virginicus*	whiskey grass	Y			1
plants	monocots	Poaceae	*Themeda quadrivalvis*	grader grass	Y			1/1
plants	monocots	Poaceae	*Phragmites australis*	common reed		C		2
plants	monocots	Poaceae	*Paspalum paniculatum*	Russell River grass	Y			2
plants	monocots	Poaceae	*Dichelachne sp. (Brisbane B.K.Simon 3221)*			C		1/1
plants	monocots	Poaceae	*Bothriochloa decipiens var. decipiens*			C		1/1
plants	monocots	Poaceae	*Hemarthria uncinata var. spathacea*			C		1/1
plants	monocots	Poaceae	*Ischaemum australe var. villosum*			C		1/1
plants	monocots	Poaceae	*Ischaemum australe var. australe*			C		1/1
plants	monocots	Poaceae	*Echinopogon nutans var. nutans*			C		1/1
plants	monocots	Poaceae	*Hyparrhenia rufa subsp. rufa*		Y			2/2
plants	monocots	Poaceae	*Lachnagrostis filiformis*			C		1/1
plants	monocots	Poaceae	*Capillipedium spicigerum*	spicytop		C		1/1
plants	monocots	Poaceae	*Austrostipa aristiglumis*	plains grass		C		1/1
plants	monocots	Poaceae	*Eragrostis spartinoides*			C		2
plants	monocots	Poaceae	*Sporobolus pyramidalis*		Y			2/2
plants	monocots	Poaceae	*Echinochloa crus-galli*	barnyard grass	Y			1/1
plants	monocots	Poaceae	*Ottochloa gracillima*	pademelon grass		C		2/1
plants	monocots	Poaceae	*Digitaria longiflora*			C		1/1
plants	monocots	Poaceae	*Cymbopogon refractus*	barbed-wire grass		C		2/1
plants	monocots	Poaceae	*Sporobolus fertilis*	giant Parramatta grass	Y			1/1
plants	monocots	Poaceae	*Paspalum conjugatum*	sourgrass	Y			2/1
plants	monocots	Poaceae	*Paspalidium distans*	shotgrass		C		1/1
plants	monocots	Poaceae	*Megathyrsus maximus*		Y			2
plants	monocots	Poaceae	*Imperata cylindrica*	blady grass		C		9/1
plants	monocots	Poaceae	*Paspalum notatum*	bahia grass	Y			1/1
plants	monocots	Poaceae	*Cynodon dactylon*		Y			2
plants	monocots	Poaceae	*Panicum effusum*			C		5/2
plants	monocots	Restionaceae	*Baloskion pallens*			C		4/2
plants	monocots	Restionaceae	*Sporadanthus caudatus*			C		4/1
plants	monocots	Restionaceae	*Sporadanthus interruptus*			C		1
plants	monocots	Restionaceae	*Leptocarpus tenax*			C		2
plants	monocots	Ruppiaceae	*Ruppia maritima*	sea tassel		C		1/1
plants	monocots	Smilacaceae	*Smilax australis*	barbed-wire vine		C		1
plants	monocots	Smilacaceae	*Smilax glyciphylla*	sweet sarsaparilla		C		1
plants	monocots	Typhaceae	*Typha orientalis*	broad-leaved cumbungi		C		2
plants	monocots	Xanthorrhoeaceae	*Xanthorrhoea fulva*	swamp grasstree		C		2
plants	monocots	Xanthorrhoeaceae	*Xanthorrhoea latifolia*			C		1
plants	monocots	Xanthorrhoeaceae	*Xanthorrhoea latifolia subsp. latifolia*			C		1/1
plants	monocots	Zingiberaceae	*Alpinia zerumbet*		Y			1/1
plants	mosses	Bartramiaceae	*Philonotis slateri*			C		1/1
plants	mosses	Bryaceae	*Rhodobryum aubertii*			C		1/1
plants	mosses	Bryaceae	*Gemmabryum coronatum*			C		3/3
plants	mosses	Bryaceae	*Rosulabryum billardierei*			C		1/1
plants	mosses	Calymperaceae	*Syrrhopodon armatus*			C		2/2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	mosses	Calymperaceae	*Syrrhopodon parasiticus*			C		1/1
plants	mosses	Dicranaceae	*Campylopus introflexus*			C		3/3
plants	mosses	Dicranaceae	*Campylopus pyriformis*			C		3/3
plants	mosses	Dicranaceae	*Dicranoloma dicarpum*			C		1/1
plants	mosses	Dicranaceae	*Dicranella baileyana*			C		1/1
plants	mosses	Entodontaceae	*Entodon plicatus*			C		1/1
plants	mosses	Funariaceae	*Funaria hygrometrica*			C		2/2
plants	mosses	Funariaceae	*Physcomitrium brisbanicum*			C		1/1
plants	mosses	Hypnaceae	*Taxiphyllum taxirameum*			C		1/1
plants	mosses	Hypnaceae	*Hypnum sp. (Burpengary C.J.Wild AQ733958)*			C		1/1
plants	mosses	Hypnaceae	*Hypnum sp. (Caboolture J.F.Shirley AQ733970)*			C		1/1
plants	mosses	Hypopterygiaceae	*Hypopterygium tamarisci*			C		1/1
plants	mosses	Leucobryaceae	*Leucobryum*			C		1/1
plants	mosses	Leucobryaceae	*Leucobryum candidum*			C		1/1
plants	mosses	Meteoriaceae	*Papillaria crocea*			C		1/1
plants	mosses	Meteoriaceae	*Barbellopsis trichophora*			C		1/1
plants	mosses	Meteoriaceae	*Papillaria leuconeura*			C		1/1
plants	mosses	Pottiaceae	*Weissia perpusilla*			C		2/2
plants	mosses	Pottiaceae	*Barbula subcalycina*			C		1/1
plants	mosses	Pottiaceae	*Weissia sp. (Victoria Park H.Tryon AQ645533)*			C		1/1
plants	mosses	Racopilaceae	*Racopilum cuspidigerum var. cuspidigerum*			C		3/3
plants	mosses	Racopilaceae	*Racopilum cuspidigerum var. convolutaceum*			C		1/1
plants	mosses	Sematophyllaceae	*Sematophyllum subhumile*			C		4/4
plants	mosses	Thuidiaceae	*Thuidium cymbifolium*			C		2/2
plants	spike mosses	Selaginellaceae	*Selaginella uliginosa*	swamp selaginella		C		1
plants		Byttneriaceae	*Seringia hillii*			C		4/4
plants		Byttneriaceae	*Commersonia bartramia*	brown kurrajong		C		1
plants		Hemerocallidaceae	*Dianella caerulea*			C		3
plants		Hemerocallidaceae	*Dianella longifolia var. stenophylla*			C		1/1
plants		Hemerocallidaceae	*Dianella revoluta*			C		4/1
plants		Hemerocallidaceae	*Tricoryne elatior*	yellow autumn lily		C		1/1
plants		Hemerocallidaceae	*Dianella longifolia var. longifolia*			C		1/1
plants		Laxmanniaceae	*Sowerbaea juncea*	vanilla plant		C		1/1
plants		Laxmanniaceae	*Lomandra multiflora*			C		1
plants		Laxmanniaceae	*Lomandra confertifolia subsp. pallida*			C		1/1
plants		Laxmanniaceae	*Lomandra multiflora subsp. multiflora*			C		1/1
plants		Laxmanniaceae	*Eustrephus latifolius*	wombat berry		C		3
plants		Laxmanniaceae	*Lomandra longifolia*			C		3
plants		Trachylomataceae	*Braithwaitea sulcata*			C		1/1
protists	brown algae	Phaeophyceae	*Hincksia mitchelliae*			C		1/1
protists	green algae	Chlorophyceae	*Chaetophora*			C		1/1
protists	green algae	Chlorophyceae	*Chara fibrosa*			C		1/1
protists	green algae	Chlorophyceae	*Udotea argentea*			C		1/1
protists	green algae	Chlorophyceae	*Caulerpa racemosa var. laetevirens*			C		1/1
protists	green algae	Chlorophyceae	*Trentepohlia bossei var. brevicellulis*			C		3/3
protists	green algae	Chlorophyceae	*Nitella tasmanica subsp. gelatinifera*			C		2/2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
protists	green algae	Chlorophyceae	*Enteromorpha clathrata*			C		1/1
protists	green algae	Chlorophyceae	*Nitella furcata*			C		1/1
protists	red algae	Rhodophyceae	*Chondria*			C		1/1
protists	red algae	Rhodophyceae	*Catenella nipae*			C		1/1
protists	red algae	Rhodophyceae	*Gracilaria verrucosa*			C		1/1
protists	red algae	Rhodophyceae	*Batrachospermum globosporum*			C		1/1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.* The codes are Presumed Extinct (PE), Endangered (E), Vulnerable (V), Rare (R), Common (C) or Not Protected ( ).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.* The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

APPENDIX D

Significant Species Profiles

Significant Species Profiles

This Appendix provides a summary profile of significant flora and fauna species that may occur in the project area and be affected by the proposed NEBP development. Significant fauna and flora species considered in this Appendix are species listed under relevant provisions of the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).* This Appendix contains a summary of relevant details concerning:

- the general ecology of the species including consideration of its critical habitat requirements, feeding and breeding behaviours;
- the distribution and abundance of the species;
- recognised threats to the viability of populations of the species;
- the likelihood of the species utilising areas to be affected by the NEBP project;
- the nature and significance of potential impacts of the NEBP project upon the viability of local populations of the species; and
- impact mitigation measures that the species may benefit from.

The species considered in this Appendix were identified based on field observations and a review of the Queensland EPA's Wildlife Online database (the EPA Database) and the Commonwealth Department of Environment and Water Resources (DEWR) EPBC Protected Matters Search Tool (DEWR Database). The relevant search area for both database searches was based on a 10km search radius from the centre of the site. Based on these sources the NEBP project has the potential to affect:

- 25 threatened terrestrial species;
- 8 threatened aquatic species;
- 23 migratory terrestrial species; and
- 3 migratory aquatic species.

The habitat requirements of each species have been examined to assess the likelihood that the species would utilise areas to be affected by the NEBP development. Each species has been allocated a rating of Very High, High, Moderate or Low according to the following criteria:

Very High: species observed in areas of suitable habitat to be directly affected by the proposal.

High: no site observations but both EPA database and DEWR database records for the species in the locality, with substantial areas of suitable habitat to be directly affected by the proposal.

Moderate: no site observations, but EPA database records for the species in the locality and at least some suitable habitat to be directly affected by the proposal.

Low: no site observations, but either EPA database records or DEWR records for the species in the locality, with no suitable habitat to be directly affected by the proposal.

(note: In respect of the above categories, the Wildlife Online database is considered to provide a more reliable assessment of the likelihood of a species occurring in SEQ due to the fact that it is based on actual recorded sightings of a species whilst the DEWR *EPBC Act* online database is not based on actual sighting records.)

Assessments of the potential of the NEBP development to have a significant impact on each species was made with reference to the known ecology of the species, the spatial extent and temporal duration of impacts, the likely efficacy of proposed impact mitigation measures, and the criteria specified in *EPBC Act* Policy Statement 1.1 - Significant Impact Guidelines - Matters of National Environmental Significance (May 2006). In this respect a Significant Impact is likely upon a species if the NEBP development results in:

- a long-term decrease in the size of a population;
- a reduction in the area of occupancy of the species;
- the fragmentation of an existing population into two or more populations;
- adverse affects to habitat critical to the survival of a species;
- disruptions to the breeding cycle of a population;
- decreases in the availability/quality of habitat to the extent that the species is likely to decline; or
- the establishment of invasive species that are harmful to a threatened species in the species´ habitat.

THREATENED TERRESTRIAL SPECIES

FLORA

Acacia attenuata

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable

Species Profile:

This slender shrub grows to a height of 3-4 m and tends not to occur further than 40 km inland from the coast. The species is restricted to heath ecotones or layered eucalypt open-forest and woodland. *Acacia attenuata* has been recorded growing in shrublands with *Leptospermum whitei* and *Baekea fructescens*, in wallum with *Banksia aemula* and *Eucalyptus robusta*, in woodlands with *Corymbia trachyphloia*, *E. umbra* and *Banksia oblongifolia,* and in open forests of E. umbra, *E. racemosa* and *Melalucea quinquenervia*. It prefers areas with high rainfall and can survive seasonal waterlogging in sandy soils. It usually occurs in areas less than 1m AHD.

Additional details:

http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=10690

Critical Habitat Resources:

Low lying, high rainfall heathland or open eucalypt forest within coastal regions.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is moderate probability of occurrence for this species on the site given that:

- the species was not observed on the site and EPA database records did not include this species;
- the site does contain areas of potential habitat in the form of low lying eucalypt and paperbark open forest associated with Raff Creek;
- the current Certified RE Map for the site does not identify remnant vegetation within the site as supporting essential habitat for this species; and
- the EPA does not specifically recognise the remnant vegetation types (i.e. RE 12.3.5 and RE 12.5.3) occurring within the site as providing valuable habitat for *Acacia attenuata*.

Recognised Threats and Potential Development Impact(s):

Urbanisation and habitat clearance constitute the greatest threat to this species.

Proposed Impact Mitigation Measures:

Removal of livestock, control of feral pigs and weed species.
Retention and enhancement of the majority of potential on-site habitat.
Use of the species in the landscaping and rehabilitation of open space areas.

Likelihood of Significant Impacts:

Low - the NEBP development is not likely to have an adverse impact on the viability of local populations of this species.

Hairy Joint Grass (*Arthraxon hispidus*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable

Species Profile:

Hairy Joint Grass is a slender, creeping grass with branching, erect to semi-erect purplish stems that form roots at the node. Leaf-blades are ovate to ovate-lanceolate, 2 – 6 cm long, broad at the base and tapering abruptly to a short point with long white hairs fringing the margins. Hairy joint grass is typically described as moisture and shade-loving grass often associated with the edges of rainforest, wet sclerophyll forest, creeks and swamps.

Additional details:

http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10066
http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=9338

Critical Habitat Resources:

There is growing evidence from the north-coast of New South Wales, that the persistence and survival of Hairy Joint Grass is driven more by a dependence on groundwater.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is a moderate probability of occurrence for this species on the site given:

- EPA database records did not include this species;
- low-lying areas of the site subject to temporary inundation and saturation are in a disturbed state owing to a history of altered land uses;
- the current Certified RE Map for the site does not identify remnant vegetation within the site as supporting essential habitat for this species; and
- the EPA does not specifically recognise the remnant vegetation types (i.e. RE 12.3.5 and RE 12.5.3) occurring within the site as providing valuable habitat for Hairy joint grass.

Recognised Threats and Potential Development Impact(s):

Major threats to this species include:

- clearing of habitat for agriculture and development;
- inappropriate fire regimes;
- over-grazing by domestic stock and slashing or mowing of habitat; and
- competition from introduced grasses such as Paspalum and Kikuyu.

However, the site has been subject to disturbance pressures associated with vegetation clearance, agricultural pursuits, plantation forestry and livestock grazing for over 100 years. As such, the potential impacts associated with the NEBP development on Hairy Joint Grass are relatively low given that the majority of the site is already in a state that would not facilitate the long-term survival of this species.

Proposed Impact Mitigation Measures:

Habitat retention and enhancement.

Likelihood of Significant Impacts:

Low - the NEBP development is not likely to have an adverse impact on the viability of local populations of this species.

Heart-leaved Bosistoa (*Bosistoa selwynii*)

Conservation Status:

NC Act – No Status
EPBC Act – Vulnerable

Species Profile:

This species occurs from Maryborough in Queensland south to the Tweed River district in north-east NSW. It is a small to medium tree to 22 m tall. Leaves consist of one top three oval leaflets, 4 - 15 cm long and 2.5 - 9 cm wide. The small white flowers are borne in loose clusters at or near the tips of branches. The fruits are hard, ribbed and egg-shaped, and contain a single kidney-shaped seed. Observations generally occur in lowland rainforests on deep basaltic soils up to 300m altitude particularly along river banks.

Additional details:

http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10874

Critical Habitat Resources:

Moister lowland rainforests on basalt soils.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is low probability of occurrence for this species on the site given:

- EPA database records did not include this species;
- the site does not support basalt derived soils or any areas of lowland rainforest;
- the current Certified RE Map for the site does not identify remnant vegetation within the site as supporting essential habitat for this species; and
- the EPA does not specifically recognise the remnant vegetation types (i.e. RE 12.3.5 and RE 12.5.3) occurring within the site as providing valuable habitat for Heart-leaved bosistoa.

Recognised Threats and Potential Development Impact(s):

Major threats to this species include:

- loss of habitat through clearing and fragmentation;
- habitat degradation through weed invasion and disturbance;
- grazing by domestic stock;
- inappropriate fire regimes; and
- timber harvesting.

However, given the site does not support basalt derived soils or associated vegetation that constitutes critical habitat resources for this species, the NEBP development is unlikely to have an impact on populations of Heart-leaved bosistoa.

Proposed Impact Mitigation Measures:

None applicable.

Likelihood of Significant Impacts:

Low - the NEBP development is not likely to have an adverse impact on the viability of local populations of this species.

Three-leaved Bosistoa (*Bosistoa transversa*)

Conservation Status:

NC Act – No Status
EPBC Act – Vulnerable

Species Profile:

This species is a medium to large tree occurring from Maryborough in Queensland south to Lismore in north-east NSW. This tree grows up to 22 m tall with a dense dark-green crown. The broad, leathery leaves are heart-shaped at the base and paired on the stem. This species grows within lowland subtropical rainforest up to an altitude of 300m.

Additional details:

http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10103

Critical Habitat Resources:

Lowland subtropical rainforest up to 300 m in altitude.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is low probability of occurrence for this species on the site given:

- EPA database records did not include this species;
- the site does not support any areas of lowland rainforest;
- the current Certified RE Map for the site does not identify remnant vegetation within the site as supporting essential habitat for this species; and
- the EPA does not specifically recognise the remnant vegetation types (i.e. RE 12.3.5 and RE 12.5.3) occurring within the site as providing valuable habitat for Three-leaved bosistoa.

Recognised Threats and Potential Development Impact(s):

Major threats to this species include:

- loss of habitat through clearing and fragmentation;
- habitat degradation through weed invasion and disturbance;
- grazing by domestic stock;
- inappropriate fire regimes; and
- timber harvesting.

However, given the site does not support any vegetation that constitutes critical habitat resources for this species, the NEBP development is unlikely to have an impact on populations of Three-leaved bosistoa.

Proposed Impact Mitigation Measures:

None applicable.

Likelihood of Significant Impacts:

Low - the NEBP development is not likely to have an adverse impact on the viability of local populations of this species.

Leafless Tongue Orchid (*Cryptostylis hunteriana*)

Conservation Status:

NC Act – No Status
EPBC Act – Vulnerable

Species Profile:

This leafless orchid has stems 50-450 mm tall with 1 to 10 flowers. The flowers are 20-30 x 6-8 mm. It occurs from Rainbow Beach to Tin Can Bay and inland to Gibraltar Range. It is a highly localised species occurring singly or in colonies in moist sandy soil in sparse to dense heath and sedgeland. They can also occur in coastal forest in moist to dry clay loam. This species has not been observed above 1000m AHD.

Additional details:
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10187

Critical Habitat Resources:

Moist sandy soil or clay loam within dense heath or sedgeland occurring below 1000m altitude.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is a moderate probability of occurrence for this species on the site given:

- the EPA database records did not include this species;
- the site does not support some areas of disturbed heath;
- the current Certified RE Map for the site does not identify remnant vegetation on the site as supporting essential habitat for this species; and
- the EPA does not specifically recognise the remnant vegetation types (i.e. RE 12.3.5 and RE 12.5.3) occurring within the site as providing valuable habitat for the Leafless tongue orchid.

Recognised Threats and Potential Development Impact(s):

As this species typically occurs in coastal areas, a major threat to its survival is increasing development pressures on coastal areas. While the site supports some habitat (i.e. swampy heath) that may provide suitable habitat for *Cryptostylis hunteriana*, it is unlikely that this species occurs within the site owing to:

- an extensive history of disturbance associated with various altered land uses that have occurred across the site;
- heavy infestations of weed species within the swampy heathland; and
- trampling and grazing by livestock.

As such, the NEBP development is unlikely to have an impact on *C. hunteriana* or critical habitat resources for this species.

Proposed Impact Mitigation Measures:

None applicable

Likelihood of Significant Impacts:

Low - the NEBP development is not likely to have an adverse impact on the viability of any local populations of this species.

Glass House Mountains Hop Bush (*Dodonaea rupicola*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable

Species Profile:

This shrub grows to 1m and has soft hairy branchlets and bipinnate leaves with up to 24 leaflets. It has small red and green flowers and is located throughout the Glass House Mountains.

Critical Habitat Resources:

In Queensland this species is restricted to Saddleback Mountain in the Glasshouse Mountains area. The limited distribution of this species appears to be largely attributed to the isolated nature of the mountain tops within the Glasshouse Mountains.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	

According to the criteria, there is low probability of occurrence for this species on the site given that it has a highly restricted distribution and occurrence.

Recognised Threats and Potential Development Impact(s):

None applicable

Proposed Impact Mitigation Measures:

None applicable

Likelihood of Significant Impacts:

None applicable

Bush Nut (*Macadamia integrifolia*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable

Species Profile:

This species occurs north of Mt Tambourine and supports stiff tough leaves which are opposite or whorled. The margins are usually wavy or toothed and the species occurs on slopes of subtropical rainforest. It is most common in very tall vineforest and prefers steep drier hillsides or slopes. This species is also found among rocks in scree slopes of basalt origin.

Critical Habitat Resources:

Slopes of Subtropical-Rainforest and very tall vineforest, on steep drier hillsides or slopes and among rocks in scree slopes of basalt origin.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is low probability of occurrence for this species on the site given the general absence of critical habitat requirements (i.e. subtropical rainforest, dry hillsides and slopes).

Recognised Threats and Potential Development Impact(s):

None applicable

Proposed Impact Mitigation Measures:

None applicable

Likelihood of Significant Impacts:

None applicable

Bopple Nut (*Macadamia ternifolia*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable

Species Profile:

This tree to 6 m is found north of Mount Nebo in subtropical rainforest. It is usually found in tall to very tall close forest or rainforest on moderate to steep slopes within fertile soil usually derived from basalt origin. Unlike *Macadamia tetraphylla* or *integrifolia* this species has a poisonous nut enclosed in a hairy shell.

Critical Habitat Resources:

Tall to very tall closed forest, rainforest on soils derived from basalt usually on steep slopes.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is low probability of occurrence for this species on the site given the site does not support any basalt derived soils or tall closed forest assemblages.

Recognised Threats and Potential Development Impact(s):

None applicable

Proposed Impact Mitigation Measures:

None applicable

Likelihood of Significant Impacts:

None applicable

Lesser Swamp Orchid (*Phaius australis*)

Conservation Status:

NC Act – Endangered
EPBC Act – Endangered

Species Profile:

This orchid occurs along the coastlines of Queensland and New South Wales at altitudes up to 1100 m. It can grow to be 2 m tall and have up to 16 flowers. Flowers are usually a deep brownish red. It is most common in swamps and islands in the Moreton District. It grows in swamps and low lying depressions within forests of the coastal lowlands. It requires full shade and is often found in association with *Melaleuca quinquenervia* wetlands.

Additional details:
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10610

Critical Habitat Resources:

Swamps and low lying depressions within forests requires full shade, often associated with *Melaleuca quinquenervia* wetlands.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	

According to the criteria, there is a moderate probability of occurrence for this species given that the site supports *Melaleuca quinquenervia* open forests and wetlands that are known to provide habitat resources for *Phaius australis*.

Recognised Threats and Potential Development Impact(s):

The major threats to this species include:

- clearing and fragmentation of habitat;
- drainage of swamps or pollution from nutrient run-off;
- frequent fire;
- grazing and trampling by domestic livestock and feral pigs; and
- weed invasion.

The site currently supports approximately 19.9 ha of paperbark open forest and wetlands along the southern and western boundaries. The NEBP development will necessitate the removal of approximately 2.7 ha of paperbark forest along the western boundary of the site.

Proposed Impact Mitigation Measures:

While there will be some removal of vegetation that constitutes favourable habitat for the Lesser swamp orchid, the NEBP Structure Plan will have a net positive outcome on vegetation suitable for the Lesser swamp orchid through the following:

- the retention of 86.6% of paperbark vegetation existing on the site;
- the removal of degrading forces such as livestock, feral pigs and source populations for weed invasion; and
- the implementation of best practice stormwater management techniques.

Likelihood of Significant Impacts:

Low - the NEBP development is not likely to have an adverse impact on the viability of local populations of this species.

MAMMALS

Grey-headed Flying-fox (*Pteropus poliocephalus*)

Conservation Status:

NC Act – Common
EPBC Act – Vulnerable

Species Profile:

The Grey-headed Flying-fox occurs in a coastal belt from Rockhampton to Melbourne and occasionally individuals are found in Bass Strait. It feeds on a wide variety of flowering and fruiting plants, including rainforest trees, eucalypts, tea-trees and banksias. Groups of this species form camps in gullies, typically not far from water and usually in vegetation with a dense canopy.

Critical Habitat Resources:

Tropical and temperate wet and dry sclerophyll forest and mangroves. Roosts in trees beside water, feeds on flowering trees.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is High probability of occurrence for this species given its habitat requirements. The Grey-headed Flying-fox would be an occasional visitor to the site, utilizing available resources provided by the paperbark and eucalypt open forests. This species may also establish temporary camps in some of the more densely vegetated sectors of the site.

Recognised Threats and Potential Development Impact(s):

Major threats to this species include:

- habitat loss;
- conflict between residents and any large camps of flying fox that may occur within the immediate region;
- interference from lighting and noise associated with the development on populations in the region; and
- increased risk of vehicle strike.

Proposed Impact Mitigation Measures:

Retention and enhancement of the majority of existing on-site habitat.
Environmental interpretation signage to advise of populations potentially occurring in the area

Likelihood of Significant Impacts:

Low - The NEBP is unlikely to have any significant impacts on this species. Habitat present is to be retained and enhanced and this species is known to be able to adapt to urban environments. Given there are no roosts present within the site it is likely that the species will continue to occur intermittently across the site.

Large-eared Pied Bat (*Chalinolobus dwyeri*)

Conservation Status:

NC Act – Rare
EPBC Act – Vulnerable

Species Profile:

This species has been recorded in scattered localities from Rockhampton in central Queensland to Bungonia in southern New South Wales (Strahn 2002). It occurs in drier habitats including dry sclerophyll forests and woodlands. Daytime roosts include caves, mine tunnels and the abandoned bottle shaped mud nests of Fairy Martins. It is suspected that this bats morphology allows for high maneuverability and feeds on small insects above the canopy of the forest.

Critical Habitat Resources:

The species requires mines, caves, hollow trees or mud nests for the purpose of roosting resources.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is low probability of occurrence for this species given its habitat requirements.

Recognised Threats and Potential Development Impact(s):

None applicable.

Proposed Impact Mitigation Measures:

None applicable.

Likelihood of Significant Impacts:

None.

Water Mouse (*Xeromys myoides*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable

Species Profile:

This species is regarded as particularly elusive and very little is known in regards to the ecology of the species. It is known it lives within mangrove communities throughout Australia with known populations ranging from the Northern Territory to South-east Queensland. The species is believed to feed on a variety of molluscs, crustaceans and polyclads located within the tidal areas of mangrove communities. It builds nests at the base of mangrove trees, with Grey Mangrove (*Avicenna marina*) the most common species targeted.

Critical Habitat Resources:

Grey Mangrove communities

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

A targeted trapping program for this species conducted by Yurrah Pty Ltd failed to capture any Water Mouse and no indicators of Water Mouse habitat have been identified on the site during the course of field surveys. Although various sectors of the site support mangrove and other marine vegetation, which may have once provided habitat for the Water Mouse, degradation associated with human-induced disturbances (e.g. weed invasion, predation by introduced predators, feral pigs, livestock etc) would have driven any local populations to extinction.

Recognised Threats and Potential Development Impact(s):

Not applicable.

Proposed Impact Mitigation Measures:

Not applicable.

Likelihood of Significant Impacts:

None.

BIRDS

Red Goshawk (*Erythrotriorchis radiatus*)

Conservation Status:

NC Act – Endangered
EPBC Act – Vulnerable

Species Profile:

Species has a distribution that encompasses coastal and sub-coastal areas from the Kimberley region of Western Australia to northern New South Wales. Throughout its range it is most frequently observed in tropical to warm temperate forests and woodlands in close proximity to watercourses and wetlands where it feeds primarily on other bird species. It is a sparsely distributed and rarely encountered species and as a consequence little is known of its biology or reasons for its apparent rarity.

Additional details:
http://www.epa.qld.gov.au/publications/p02093aa.pdf/Red_goshawk_emErythrotriorchis_radiatus/em.pdf

Critical Habitat Resources:

Various habitat types including coastal & sub-coastal tall open forest, tropical savannah adjacent to wooded or forested rivers, and rainforest edges are utilised with a preference for a mosaic of vegetation types near to a permanent watercourse.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is moderate probability of occurrence at this site given the habitat preferences of the species. The *Casuarina* species, *Melaleuca* species and mangrove areas may provide suitable habitat for the species.

Recognised Threats and Potential Development Impact(s):

Habitat clearing for development.
Anthropological disturbance to nesting sites.

Proposed Impact Mitigation Measures:

Controlled or stages clearing of land.
Habitat supplementation in areas of ecological value to be retained.
Monitoring and maintaining fire regime with conservation areas.
Location and buffering of any potential Red Goshawk Nests.

Likelihood of Significant Impacts:

Low – The NEBP is not likely to have any long term significant impacts upon this species. Whilst there is habitat present and there have been records within the area it is considered that adequate rehabilitation and conservation of areas of ecological value within the NEBP will protect any populations of this species in the area.

Australian Painted Snipe (*Rostratula australis*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable

Species Profile:

This species has a scattered distribution across Australia and is usually found in freshwater or brackish, shallow, inland wetland areas. It nests on the ground in tall reed-like vegetation near water and feeds on worms, insects and seeds.

Additional details:
http://www.environment.gov.au/biodiversity/threatened/publications/painted-snipe.html

Critical Habitat Resources:

Shallow and vegetated wetland areas are considered important habitat types for this species.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is moderate probability of occurrence given the habitat and foraging site requirements of the species. The subject site supports areas of disturbed salt couch grasslands and heathland which include brackish and freshwater streams. This species may occur intermittently within these areas.

Recognised Threats and Potential Development Impact(s):

Wetland habitat loss and degradation.
Increased anthropological activity within nesting sites.

Proposed Impact Mitigation Measures:

Best practice storm water management.
Habitat rehabilitation within conservation areas.

Likelihood of Significant Impacts:

Low – Habitat present within the NEBP is considered to be marginal and disturbed with only a moderate probability of the species occurring on the site. The disturbed salt couch grassland and heathland does support some brackish and fresh water streams however no characteristics present can be considered to be critical habitat resources.

Swift Parrot (*Lathamus discolor*)

Conservation Status:

NC Act – Endangered
EPBC Act – Endangered

Species Profile:

This species breeds exclusively in Tasmania, coinciding its breeding season with the flowering of the Tasmanian blue gum. Migration to the mainland of Australia occurs in autumn where the species forages on lerps and nectar in box ironbark forests and eucalypt woodlands in Victoria, New South Wales and occasionally in the Australian Capital Territory and south east Queensland.

Additional details:
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10455;
http://www.environment.gov.au/biodiversity/threatened/publications/recovery/swift-parrot/pubs/swift-parrot.pdf

Critical Habitat Resources:

Preferences of habitat for the swift parrot, in Queensland, include eucalypts such as narrow leaved ironbark, yellow box forests and forest red gum. Larger trees are believed to be preferred by the species.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is moderate probability of occurrence at this site given the habitat requirements of the species. The species had records from EPA database indicating that it has been observed previously within the immediate region of the site and there is known habitat supporting the characteristics required by this species. The EPBC database shows that the species or species habitat is known to occur within the area.

Recognised Threats and Potential Development Impact(s):

Habitat loss.
Anthropological interference to nesting areas.
Increase activity of domestic pets.

Proposed Impact Mitigation Measures:

Habitat and potential nesting areas to be retained and enhanced.

Likelihood of Significant Impacts:

Low – this species often moves in flocks and is gregarious in nature, it will associate with different lorikeet and parrot species and move as individuals within a larger flock. The development will retain potential habitat for the species.

Regent Honeyeater (*Xanthomyza phrygia*)

Conservation Status:

NC Act – Endangered
EPBC Act – Endangered, Migratory

Species Profile:

This species range has dramatically decreased over the last thirty years from south-east Queensland to north-eastern Victoria. It inhabits woodland areas with dense canopies and a large number of large trees. The habitats occupied by this species are generally found on the inland slopes of forests in south-east Queensland. Noisy, aggressive and conspicuous, it forages mainly in flowers and foliage in the upper canopy, feeding on nectar, fruits and insects. Breeding occurs from August to January.

Additional details:
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10841

Critical Habitat Resources:

Eucalypt forest and woodland are considered critical habitat for this species.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the habitat requirements of the species, there is a moderate probability that the species will occur at this site, given the criteria. this species is cryptic in nature and prefers heavily wooded areas with dense canopies and a large number of trees supporting hollows. The subject site demonstrates some characteristics required for this species however these characteristics are spread across a large distance and do not conform in total.

Recognised Threats and Potential Development Impact(s):

Habitat loss.
Anthropological interference to nesting areas.
Increase activity of domestic pets.

Proposed Impact Mitigation Measures:

Habitat and potential nesting areas to be retained and enhanced.

Likelihood of Significant Impacts:

Low – The subject site doesn't remove any critical habitat for this species.

Squatter Pigeon- southern sub-species (*Geophaps scripta scripta*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable

Species Profile:

This sub-species occupies a variety of habitats including open forests, dominated by eucalypts, grassy woodlands, disturbed habitats and sown grasslands with remnant vegetation present. The bird is similar in appearance to the northern, non threatened sub-species (*Geophaps scripta peninsulae*), except for the coloration of skin surrounding the eye. Both species inhabit grassy plains and woodlands. Although listed as vulnerable, the species remains common in heavily grazed areas north of the Tropic of Capricorn and is commonly observed in habitats close to a water body. The squatter pigeon feeds mainly on the seeds of grasses, legumes and other herbaceous plants.

Additional details:
http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64440#habitat

Critical Habitat Resources:

The squatter pigeon has been recorded as requiring a various range of habitat types including woodland, grassland and shrubland.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is low probability of occurrence at this site given the habitat preferences of the species. The presence of grazed grasslands and disturbed, remnant vegetation may meet the requirements of the species.

Recognised Threats and Potential Development Impact(s):

Not applicable.

Proposed Impact Mitigation Measures:

Not applicable.

Likelihood of Significant Impacts:

The NEBP is unlikely to have an impact upon this species.

Coxen's Fig-Parrot (*Cyclopsitta diophthalma coxenii*)

Conservation Status:

NC Act – Endangered
EPBC Act – Critically Endangered, Migratory

Species Profile:

This species is distributed across south-east Queensland and northern New South Wales. Habitat preference is general, having been sighted in both upland and lowland areas of riparian corridors in woodland, subtropical rainforest and littoral forest. Habitats where fig trees are present are thought to be favoured. Breeding sites are also variable, with nests reported within, and on ecotones of, subtropical rainforest, dry rainforest and sclerophyll forests.

Additional details:
http://www.environment.gov.au/biodiversity/threatened/publications/recovery/fig-parrot/pubs/fig-parrot.pdf

Critical Habitat Resources:

The presence of fruiting trees, particularly fig trees, seems to be of importance in habitat preference of the Coxen's Fig-Parrot. No single habitat type has been identified as critical.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is moderate probability of occurrence at this site given the habitat and forage preferences of the species which, includes riparian woodland and fruiting trees (eg. Fig, Camphor laurel, Lantana).

Recognised Threats and Potential Development Impact(s):

Habitat loss from vegetation clearing.
Anthropological disturbance to breeding areas.
Loss of feeding resources due to vegetation clearing.
Low population preventing a social breeding trigger being activated.

Proposed Impact Mitigation Measures:

Protect and enhance habitat.
Implement a community awareness strategy.

Likelihood of Significant Impacts:

Low - The NEBP will not have any adverse impacts upon this species. The majority of the habitat for this species that is present within the site will be retained or enhanced.

Black-breasted Button-quail (*Turnix melanogaster*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable

Species Profile:

This species lives in dense habitat types such as rainforest and microphyll vine forests, preferring drier low closed forests. A deep leaf litter on the forest floor is imperative to the species in order to meet its foraging requirements. The species has been recorded in national parks, council and military areas throughout Queensland and extends its range down the coast of New South Wales.

Additional details:
http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=923#habitat

Critical Habitat Resources:

A deep leaf litter is considered important for foraging in this species and also possibly for roosting. Forests with various, dense shrub layers and fallen logs are also important shelter and breeding habitat requirements for the black-breasted button quail.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is low probability of occurrence for this species given its habitat requirements.

Recognised Threats and Potential Development Impact(s):

Not applicable.

Proposed Impact Mitigation Measures:

Not applicable.

Likelihood of Significant Impacts:

None.

Southern Giant-petrel (*Macronectes giganteus*)

Conservation Status:

NC Act – Endangered
EPBC Act – Endangered, Migratory

Species Profile:

The Southern Giant-petrel is a migratory bird with a pelagic lifestyle. During summer, this species nests on Antarctic and sub-Antarctic islands. South-eastern Australia is regarded as an important wintering site. Sightings of the species have been recorded in South America, South Africa, Australia and New Zealand. The species feed on penguin and seal carrion and will dive, or surface seize, for fish and cephalopods.

Additional details:
(http://www.nationalparks.nsw.gov.au/npws.nsf/Content/Southern+giant+petrel+-+endangered+species+listing;
http://www.environment.gov.au/biodiversity/threatened/publications/recovery/albatross/breeding.html#2.7)

Critical Habitat Resources:

Breeds in Antarctic and sub-Antarctic islands
Pelagic lifestyle - feeds over open water and on marine carrion

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is a low probability of occurrence given the habitat requirements and pelagic lifestyle of this species.

Recognised Threats and Potential Development Impact(s):

None applicable

Proposed Impact Mitigation Measures:

None applicable

Likelihood of Significant Impacts:

None

Northern Giant-Petrel (*Macronectes hallii*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable, Migratory

Species Profile:

The Northern Giant-petrel is a migratory bird with a pelagic lifestyle. Their range extends over Antarctica and into subtropical waters during winter and spring. In Australia, the northern giant petrel breeds only on Macquarie Island. The species scavenge on penguin and seal carcasses and will dive or surface seize, for fish and cephalopods.

Additional details:
(http://www.nationalparks.nsw.gov.au/npws.nsf/Content/Macronectes_halli_vulnerable;
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10913)

Critical Habitat Resources:

Macquarie Island nesting sites.
Pelagic lifestyle – feeds over open water penguin and seal carrion.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is a low probability of the Northern Giant-petrel occurring at this site due to its habitat requirements and lifestyle.

Recognised Threats and Potential Development Impact(s):

None applicable

Proposed Impact Mitigation Measures:

None applicable

Likelihood of Significant Impacts:

None

Campbell Albatross (*Thalassarche impavida*)

Conservation Status:

NC Act – No Status
EPBC Act – Vulnerable, Migratory

Species Profile:

The distribution of the species ranges across Antarctic and sub-Antarctic waters and into the subtropical South Pacific Ocean. The Campbell Albatross breeds specifically on Campbell Island, south of New Zealand. Non-breeding birds will forage across the continental slopes of the south-eastern coast of Australia.

Additional details:
(http://www.environment.gov.au/biodiversity/threatened/publications/recovery/albatross/foraging.html#3.8)

Critical Habitat Resources:

Pelagic lifestyle
South-east coast of Australia is the known range

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is low probability of occurrence of this species due to its specificity of breeding site and southern distribution.

Recognised Threats and Potential Development Impact(s):

None applicable

Proposed Impact Mitigation Measures:

None applicable

Likelihood of Significant Impacts:

None

REPTILES

Three-toed Snake-tooth Skink (*Coeranoscincus reticulatus*)

Conservation Status:

NC Act – Rare
EPBC Act – Vulnerable

Species Profile:

This species is distributed between the northern rivers district, north-eastern NSW and south-east Queensland. It inhabits rainforests and occasionally moist eucalypt forest on loamy or sandy soils. The skink lives within leaf litter, rotting logs and loose soil and feeds on earthworms and beetle grubs.

Critical Habitat Resources:

Fallen timber, rotting logs within rainforest or wet sclerophyll vegetation communities.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

There is low probability of this species occurring on at the NEBP site given the general absence of suitable habitat on the site.

Recognised Threats and Potential Development Impact(s):

Not applicable.

Proposed Impact Mitigation Measures:

None applicable.

Likelihood of Significant Impacts:

None.

AMPHIBIANS

Giant Barred Frog (*Mixophyes iteratus*)

Conservation Status:

NC Act – Endangered
EPBC Act – Endangered

Species Profile:

This species forages and lives in deep and moist leaf litter in rainforests, moist eucalypt forests and neighbouring dry eucalypt forests. This species breeds in shallow, rocky streams in rainforests, wet sclerophyll forests and farmland at altitudes ranging from 100 – 1,000 metres or in deep, slow moving streams in the lowlands. The giant barred frog is found in these habitat types ranging from Belli Creek near Eumundi, SEQ, to Warrimoo, mid-east NSW (26° 31'S, 152° 49'E - 33° 43'S, 150° 36'E). North eastern NSW, particularly the Coffs Harbour-Dorrigo region is now a stronghold.

Additional details:
http://www.epa.qld.gov.au/nature_conservation/wildlife/threatened_plants_and_animals/endangered/giant_barredfrog/;
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10538

Critical Habitat Resources:

A moving water body is of particular importance to the giant barred frog in order to meet its habitat requirements. Damp, foraging areas (eg. leaf litter) are also of importance to the giant barred frog.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

There is a low probability that this species occurs at the NEBP site due to the absence of suitable habitat.

Recognised Threats and Potential Development Impact(s):

Not applicable.

Proposed Impact Mitigation Measures:

None applicable.

Likelihood of Significant Impacts:

None.

INSECTS

Australian Fritillary (*Argyreus hyperbius inconstans*)

Conservation Status:

NC Act – Endangered
EPBC Act – Endangered

Species Profile:

The majority of specimens have been collected from river estuaries and swampy coastal areas at or near sea level. It has been recorded from Gympie, south east Queensland to Port Macquarie in north east NSW. The larvae have a specific host plant, Native Violet (*Viola betonicifolia*), which restricts the distribution of the species to areas of *Melaleuca* wetlands. However, this small, insignificant ground herb is not found in every *Melaleuca* wetland but only in association with Long-leaved Matrush (*Lomandra longifolia)* and Blady Grass (*Imperata cylindrica*) thus restricting the distribution range of the butterfly.

Additional details:
(http://www.epa.qld.gov.au/nature_conservation/wildlife/native_animals/australian_fritillary_butterfly/)

Critical Habitat Resources:

The larval food plant, Native Violet (*Viola betonicifolia*), is vital for the breeding efforts of the butterfly. Therefore, Ling-leaved Matrush and Blady grass are also important habitat resources.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	

According to the criteria, there is moderate possibility of occurrence given the habitat requirements of the species. The site supports numerous examples of *Lomandra* species and Blady Grass making it likely that some occurrences of Native Violet also are present.

Recognised Threats and Potential Development Impact(s):

Habitat loss and degradation.

Proposed Impact Mitigation Measures:

Removal of livestock, control of feral pigs and weed species.
Retention and enhancement of the majority of existing on-site paperbark wetland habitats.
Use of the larvae host plant, Native Violet, in the landscaping and rehabilitation of open space areas.

Likelihood of Significant Impacts:

Low - the NEBP development is not likely to have an adverse impact on the viability of local populations of this species and has the potential to provide positive impact upon the conservation status of this species.

THREATENED AQUATIC SPECIES

MARINE REPTILES

Loggerhead Turtle (*Caretta caretta*)

Conservation Status:

NC Act – Endangered
EPBC Act – Endangered, Migratory

Species Profile:

This species has a global distribution throughout tropical, sub-tropical and temperate waters. It occurs in the waters of coral and rocky reefs, seagrass beds and muddy bays throughout eastern, northern and western Australia and has been recorded in the coastal waters of all states.

Additional details:

http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1763
http://www.environment.gov.au/coasts/publications/turtle-recovery/pubs/marine-turtles.pdf
Marquez, R.M. (1990). FAO Species Catalogue. Vol. 11, Sea Turtles of the World, FAO, Rome.

Critical Habitat Resources:

Hatchling to sub-adult Loggerheads occur in the open ocean foraging on planktonic organisms and larger loggerheads enter the benthic foraging habitat at a larger size than other hard-shelled sea turtles where they can remain residents for extended periods. Adults and large juveniles, greater than (70 cm curved carapace length) occur in waters with both hard and soft substrates including rocky and coral reefs, muddy bays, sandflats, estuaries and seagrass meadows. The lower section of the Cabboolture River and adjacent area of Moreton Bay is potential foraging habitat for this species. Loggerheads breed on tropical sandy beaches and feed on a range of benthic invertebrates.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is a moderate probability of occurrence at this site given the habitat preference of this species. The lower section of the Caboolture River and adjacent area of Moreton Bay may be suitable foraging habitat.

Recognised Threats and Potential Development Impact(s):

The recognised threats to marine turtles that have potential to be associated with the proposed marina development are:

- coastal development;
- deteriorating water quality;
- marine debris;
- loss of habitat; and
- boat strike.

Proposed Impact Mitigation Measures:

It is understood that, as part of the design of the project, there is an opportunity to use some of the treated water from the Caboolture WWTP to irrigate the golf courses and other open space areas on the study site. This opportunity provides a significant potential benefit to the local marine environment by helping to reduce the high levels of nutrients already

present and known to be affecting the ecology of the river and potentially the nearby adjacent areas of Moreton Bay. This would assist to minimise the threats of coastal development and deteriorating water quality to sea turtles and their benthic foraging habitat,

In regard to boat strike, opportunities for awareness raising and educative activities with new boat users associated with the proposed marina could be included in the environmental management plan (EMP) for the development. Awareness and speed limit signage would ensure that personal watercraft would not be driven in a way or at a speed that could reasonably be expected to result in the striking of a sea turtle.

Likelihood of Significant Impacts:

Given that there would be no direct impact on marine turtle foraging or nesting habitat, potentially an improvement in water quality and controls on the speed of any vessels associated with the proposed marina, there are unlikely to be any significant impacts to loggerhead turtles.

Green Turtle (*Chelonia mydas*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable, Migratory

Species Profile:

Green Turtles are found in tropical and subtropical waters throughout the world, normally remaining within the northern and southern limits of the 20°C isotherms, but individuals may stray into temperate waters. Green Turtles make long reproductive migrations between foraging grounds and nesting areas. Although migrations recorded from rookeries in the southern GBR have exceeded 2600 km the average migration is approximately 400 km.

Additional details:
http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1765
http://www.environment.gov.au/coasts/publications/turtle-recovery/pubs/marine-turtles.pdf
Marquez, R.M. (1990). FAO Species Catalogue. Vol. 11, Sea Turtles of the World, FAO, Rome.

Critical Habitat Resources:

Post hatchling and juvenile turtles up to 30 cm curved carapace length are pelagic, drifting on the surface of the water, usually associated with Sargassum drift-lines. At a size between 30 and 40 cm curved carapace length they move to shallow benthic foraging habitat containing seagrass and/ or algae where they remain for several decades. These habitats include coral and rocky reefs, and inshore seagrass beds. Although carnivorous when young, green turtles are primarily herbivorous, with a major diet of seagrass and algae. They also feed on a variety of other items including mangrove, fish eggcases, jellyfish and sponges. The lower section of the Caboolture River and adjacent area of Moreton Bay is potential foraging habitat for this species. In Australia, green turtles nest on beaches in the Gulf of Carpentaria, Rayne Island and coral cays in the Capricorn and Bunker Groups.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is a moderate probability of occurrence at this site given the habitat preference of this species. The lower section of the Caboolture River and adjacent area of Moreton Bay may be suitable resting habitat.

Recognised Threats and Potential Development Impact(s):

The recognised threats to marine turtles that have potential to be associated with the proposed marina development are:

- coastal development;
- deteriorating water quality;
- marine debris;
- loss of habitat; and
- boat strike.

Proposed Impact Mitigation Measures:

It is understood that, as part of the design of the project, there is an opportunity to use some of the treated water from the Caboolture WWTP to irrigate the golf courses and other open space areas on the study site. This opportunity provides a significant potential benefit to the local marine environment by helping to reduce the high levels of nutrients already present and known to be affecting the ecology of the river and potentially the nearby adjacent areas of Moreton Bay. This would assist to minimise the threats of coastal

development and deteriorating water quality to sea turtles and seagrass decline (an important habitat to green turtles) in Moreton Bay which has been attributed to the runoff and pollution from urbanisation and coastal development,

In regard to boat strike, opportunities for awareness raising and educative activities with new boat users associated with the proposed marina could be included in the EMP for the development. Awareness and speed limit signage would ensure that personal watercraft would not be driven in a way or at a speed that could reasonably be expected to result in the striking of a sea turtle.

Likelihood of Significant Impacts:

Given that there would be no direct impact on marine turtle foraging habitat, potentially an improvement in water quality and controls on the speed of any vessels associated with the proposed marina, there are unlikely to be any significant impacts to green turtles.

Leatherback Turtle (*Dermochelys coriacea*)

Conservation Status:

NC Act – Endangered
EPBC Act – Vulnerable, Migratory

Species Profile:

This species has the widest distribution of any marine turtle, occurring from the North Sea and the Gulf of Alaska in the Northern Hemisphere, to Chile and New Zealand in the Southern Hemisphere. Leatherback Turtles are pelagic feeders, found in tropical, subtropical and temperate waters throughout the world and has been recorded feeding in the coastal waters of all Australian States.

Additional details:
http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1768
http://www.environment.gov.au/coasts/publications/turtle-recovery/pubs/marine-turtles.pdf
Marquez, R.M. (1990). FAO Species Catalogue. Vol. 11, Sea Turtles of the World, FAO, Rome.

Critical Habitat Resources:

This species makes reproductive migrations from foraging areas to nesting beaches, although it is thought that no nesting occurs in Australia.

Leatherbacks utilise pelagic habitat in both the juvenile and adult phases of their life history. Small juveniles seem to disappear for several years but may concentrate around upwellings where food sources are abundant. Large juvenile and adult turtles are found in both pelagic and coastal waters from tropical to temperate and boreal waters. Foraging occurs throughout the water column from the surface layer to depths of over 200 m. Little is known about the diet of post-hatchlings and small juveniles as they seem to disappear for several years after entering the open ocean. The diet of adults is dominated by gelatinous organisms such as jellyfish, salps, squid and siphonophores.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is a low probability of occurrence at this site given the habitat preference of this species. The lower section of the Caboolture River and adjacent area of Moreton Bay may be suitable resting habitat only.

Recognised Threats and Potential Development Impact(s):
The recognised threats to marine turtles that have potential to be associated with the proposed marina development are:

- coastal development;
- deteriorating water quality;
- marine debris;
- loss of habitat; and
- boat strike.

Proposed Impact Mitigation Measures:

It is understood that, as part of the design of the project, there is an opportunity to use some of the treated water from the Caboolture WWTP to irrigate the golf courses and other open space areas on the study site. This opportunity provides a significant potential benefit to the local marine environment by helping to reduce the high levels of nutrients already present and known to be affecting the ecology of the river and potentially the nearby adjacent areas of Moreton Bay. This would assist to minimise the threats of coastal development and deteriorating water quality to sea turtles,

In regard to boat strike, opportunities for awareness raising and educative activities with new boat users associated with the proposed marina could be included in the EMP for the development. Awareness and speed limit signage would ensure that personal watercraft would not be driven in a way or at a speed that could reasonably be expected to result in the striking of a sea turtle.

Likelihood of Significant Impacts:

Potentially, Leatherback Turtles may rest in the lower section of the Caboolture River and forage in the adjacent areas of Moreton Bay. Given that there would be no direct impact on these areas, potentially an improvement in water quality and controls on the speed of any vessels associated with the proposed marina, there are unlikely to be any significant impacts to Leatherback Turtles.

Pacific Ridley (*Lepidochelys olivacea*)

Conservation Status:

NC Act – Endangered
EPBC Act – Endangered, Migratory

Species Profile:

The Pacific Ridley or Olive Ridley is the smallest of the Australian sea turtles and the most abundant. This species is found in tropical and subtropical waters throughout the world, with large nesting aggregations in the eastern Pacific and in India. No concentrated nesting has been found in Australia, with irregular nesting only in eastern Qld and NSW. Reproductive migrations have not been recorded for this species in Australia because no ongoing tagging program exists. However, studies in the eastern Pacific and Atlantic Ocean show long distance reproductive migratory behaviour similar to other sea turtle species. Journeys of up to 1900 km have been recorded in the Atlantic Ocean.

Additional details:
http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1767
http://www.environment.gov.au/coasts/publications/turtle-recovery/pubs/marine-turtles.pdf
Marquez, R.M. (1990). FAO Species Catalogue. Vol. 11, Sea Turtles of the World, FAO, Rome.

Critical Habitat Resources:

Post-hatchlings and small juvenile turtles occur in the surface waters of the open ocean but little is known about their diet during this stage. Large juveniles and adults of this species have been recorded in both benthic and pelagic foraging habitats. Foraging habitat can range from depths of several metres to over 100 m. However, most individuals captured by trawlers in the E coast otter trawl fishery in Qld were in depths of between 11 to 40 m. Trawling data from the east coast of Qld indicate that benthic foraging habitat supports turtles between 20 and 80 cm curved carapace length. The most comprehensive feeding study in Australia documented mostly gastropod and bivalve molluscs from the stomachs of 36 adult Olive Ridley turtles. Crabs, shrimp, tunicates, jellyfish, salps and algae have been found in their diet in studies outside Australia.

In Australia, nesting occurs mainly on the beaches of inshore islands in Arnhem Land and the Gulf of Carpentaria.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is a moderate probability of occurrence at this site given the habitat preference of this species. The lower section of the Caboolture River and adjacent area of Moreton Bay may be suitable foraging habitat.

Recognised Threats and Potential Development Impact(s):

The recognised threats to marine turtles that have potential to be associated with the proposed marina development are:

- coastal development;
- deteriorating water quality;
- marine debris;
- loss of habitat; and
- boat strike.

Proposed Impact Mitigation Measures:

It is understood that, as part of the design of the project, there is an opportunity to use some of the treated water from the Caboolture WWTP to irrigate the golf courses and other

open space areas on the study site. This opportunity provides a significant potential benefit to the local marine environment by helping to reduce the high levels of nutrients already present and known to be affecting the ecology of the river and potentially the nearby adjacent areas of Moreton Bay. This would assist to minimise the threats of coastal development and deteriorating water quality to sea turtles habitat which has been attributed to the runoff and pollution from urbanisation and coastal development,

In regard to boat strike, opportunities for awareness raising and educative activities with new boat users associated with the proposed marina could be included with the EMP for the development. Awareness and speed limit signage would ensure that personal watercraft would not be driven in a way or at a speed that could reasonably be expected to result in the striking of a sea turtle.

Likelihood of Significant Impacts:

Given that there would be no direct impact on marine turtle foraging habitat, potentially an improvement in water quality and controls on the speed of any vessels associated with the proposed marina, there are unlikely to be any significant impacts to Pacific Ridley.

Hawksbill Turtle (*Eretmochelys imbricata*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable, Migratory

Species Profile:

Hawksbill turtles are found in tropical, subtropical and temperate waters in all the oceans of the world. In Australia there are two nesting populations in the Great Barrier Reef and Arnhem Land and the NW Shelf. These are genetically distinct from each other and from populations in other countries, indicating little interbreeding between populations. Limited studies have shown that this species migrates up to 2400 km between foraging areas to nesting beaches. These have linked nesting populations of eastern Qld to the Solomon Is, Indonesia, PNG, and Vanuatu.

Additional details:
http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1766
http://www.environment.gov.au/coasts/publications/turtle-recovery/pubs/marine-turtles.pdf
Marquez, R.M. (1990). FAO Species Catalogue. Vol. 11, Sea Turtles of the World, FAO, Rome.

Critical Habitat Resources:

Post-hatchlings, during their oceanic phase, feed on planktonic plants and animals but little is known about this phase for this species in Australia. Juvenile and adult hawksbill turtles have been described as sponge specialists but other evidence suggests they are omnivorous feeding on a variety of animals and plants including sponges, hydroids, cephlapods, gastropods, cnidarians, seagrass and algae. In Australia they eat both sponges and algae in high proportions. At between 30 and 40 cm curved carapace length they recruit to benthic foraging grounds where they remain for decades.

In Australia, nesting occurs mainly on the beaches of inshore islands in Arnhem Land and the Gulf of Carpentaria and on tropical beaches in the northern Great Barrier Reef islands.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is a moderate probability of occurrence at this site given the habitat preference of this species. The lower section of the Caboolture River and adjacent area of Moreton Bay may be suitable foraging habitat.

Recognised Threats and Potential Development Impact(s):

The recognised threats to marine turtles that have potential to be associated with the proposed marina development are:

- coastal development;
- deteriorating water quality;
- marine debris;
- loss of habitat; and
- boat strike.

Proposed Impact Mitigation Measures:

It is understood that, as part of the design of the project, there is an opportunity to use some of the treated water from the Caboolture WWTP to irrigate the golf courses and other open space areas on the study site. This opportunity provides a significant potential benefit to the local marine environment by helping to reduce the high levels of nutrients already present and known to be affecting the ecology of the river and potentially the nearby

adjacent areas of Moreton Bay. This would assist to minimise the threats of coastal development and deteriorating water quality to sea turtles and seagrass decline (an important habitat to hawksbill turtles) in Moreton Bay which has been attributed to the runoff and pollution from urbanisation and coastal development,

In regard to boat strike, opportunities for awareness raising and educative activities with new boat users associated with the proposed marina could be included with the EMP for the development. Awareness and speed limit signage would ensure that personal watercraft would not be driven in a way or at a speed that could reasonably be expected to result in the striking of a sea turtle.

Likelihood of Significant Impacts:

Given that there would be no direct impact on marine turtle foraging habitat, potentially an improvement in water quality and controls on the speed of any vessels associated with the proposed marina, there are unlikely to be any significant impacts to Hawksbill Turtles.

FISH

Honey Blue-eye (*Pseudomugil mellis*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Vulnerable

Species Profile:

This species has a restricted range in southern Qld, occurring from the Brisbane area northwards to the Bundaberg area, including Fraser Island. The mainland distribution extends from Caboolture in the south to Tin Can Bay in the North, but it is understood that the range had been severely reduced in recent times. This species remains relatively abundant in the Noosa River and Fraser Island localities and appears to occur in reasonable numbers in most Tin Can Bay creeks of SE Qld. Most populations of this species are isolated from one another. No Honey Blue-eye were recorded during the surveys for the proposed development, despite sampling using traps and nets within and adjacent to the site.

Additional details:
http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=26180
Arthington, A.H. and Marshall, J.M. (1995). Threatened fishes of the world: *Pseudomugil mellis* Allen & Ivantsoff, 1982 (Pseudomugilidae). Env. Bio. Fishes. 43(268).
Howe, E., Howe, C., Lim , R. and Burchett, M. (1997). Impact of the introduced poeciliid *Gambusia holbrooki* (Gurard, 1859) on the growth and reproduction of *Pseudomugil signifier* (Knwer, 1865) in Australia. Mar, Freshwater. Res. 48(425-34).

Critical Habitat Resources:

This species is typically found in the coastal lowland "wallum" ecosystem. Wallum country has a well-distributed annual rainfall (1016-1778 mm) and freshwater lakes, creeks and wetlands are a prominent landscape feature. The species usually occurs where there is little or no flow and the fish can find shelter within or near to emergent and submerged aquatic macrophytes. Honey Blue-eye were once found to be abundant in a variety of brackish and freshwater environments between 1977-1988 but more recent studies did not make any observations to support the abovementioned salinity tolerances. This species can tolerate wide fluctuations in temperature, from 14°C in winter to 38°C in summer and it is thought that fluctuations in populations can be partly explained by floods flushing large numbers of the fish into tidal areas below natural barriers.

Honey blue-eye are not specialised feeders, eating shrimp-like crustaceans and waterfleas, various aquatic and terrestrial insects, other aquatic invertebrates, fish eggs or larvae. They may also consume large quantities of desmids (freshwater algae) and diatoms.

Males exhibited territorial behaviour throughout the year, guarding vegetated sites from other intruding males. Spawning activities between pairs are confined to aquatic vegetation where the eggs are attached.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is a moderate probability of occurrence at this site given the habitat preference of this species. The tidal section of the Caboolture River and associated creeks may be suitable habitat.

Recognised Threats and Potential Development Impact(s):

While very little is written about recognised threats to this species, it would appear that the species is vulnerable to landuse practices and activities with potential to degrade aquatic vegetation and waterway ecology, such as urban development, alterations to flow regimes and water pollution. The introduced mosquito fish (*Gambusia holbrooki*) is also thought to be a threat to the Honey Blue-eye. Increased turbidity associated with construction of the proposed development may have potential to affect populations of this species.

Proposed Impact Mitigation Measures:

It is possible that a viable population does occur in the Caboolture River particularly in freshwaters upstream of the weir and in the upper parts of some of the creeks (e.g. King John Creek, Goong Creek and Raff Creek). Raff Creek would be maintained as part of the proposed development thus, if Honey Blue-eye did occur there, their population should be conserved. Further, an EMP will be implemented in accordance with the development and this could include procedures for controlling mosquito fish.

Likelihood of Significant Impacts:

Given that there would be no direct impact on honey blue-eye habitat above the weir and in Raff Creek, potentially an improvement in water quality, there are unlikely to be any significant impacts to Honey Blue-eye. An EMP would potentially contain procedures for controlling mosquito fish and reduce the potential for increased turbidity to waterways potentially associated with construction

Great White Shark (*Carcharodon carcharias*)

Conservation Status:

NC Act – none
EPBC Act – Vulnerable, Migratory

Species Profile:

The Great White Shark is widely distributed, and located throughout temperate and sub-tropical regions in the northern and southern hemispheres. In Australia, its range extends primarily from Moreton Bay in southern Queensland, with at least one record as far north as Mackay, around the southern coastline and to North West Cape in Western Australia. The current population status of Great White Sharks in Australia is difficult to assess due to a paucity of information but anecdotal information (sightings by tourist operators and catches from beach netting programs suggest a decline.

Additional details:
http://www.environment.gov.au/coasts/publications/gwshark-plan/pubs/greatwhiteshark.pdf

Critical Habitat Resources:

To date there is little solid information or research findings upon which to identify habitat critical to the survival of the species. Great White Sharks are normally found in inshore waters in the vicinity of rocky reefs and islands, and often near seal colonies, although they have been caught at varying depths to 1280m. While the species is widely distributed they appear to be far more common in some locations such as South Africa, Australia and United States of America than at others. Particular areas are also seen as important pupping grounds. Juveniles are most commonly encountered in inshore areas, often in the vicinity of the open coast beaches. Although not often encountered in estuaries adults and juveniles may occur there from time to time and therefore potentially in the lower section of the Caboolture River and adjacent area of Moreton Bay.

Great White Sharks do not feed continuously, a large meal such as a seal may sustain a medium sized shark for as long as a week. They appear to exhibit an age/size preference for certain foods. This developmental change in diet reveals a preference for fish in the juvenile Great White Sharks (less than 2.7 metres). As they increase in size the diet will expand to include other sharks, rays, marine reptiles, sea birds and marine mammals.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is a low probability of occurrence at this site given the habitat preference of this species. The tidal section of the Caboolture River may be suitable foraging habitat for juvenile sharks but only very occasionally.

Recognised Threats and Potential Development Impact(s):

Despite not being commercially targeted, great white sharks are caught as by-catch on long-lines and in nets of professional fishers, and this is currently suspected to be the largest cause of mortality. Meshing of sharks as a protective measure for swimmers and surfers also catch Great White Sharks. The degree to which beach meshing is impacting on populations of the species is unknown although the decline in captures suggests it is significant. The proposed development would not result in any of the threats listed above and is not considered to constitute any other plausible threat to this species.

Proposed Impact Mitigation Measures:

The design of the project and implementation of an environmental management plan would ensure that habitats in the Caboolture River were maintained and improved, thus benefiting coastal ecology and the environment of Great White Sharks in general.

Likelihood of Significant Impacts:

Given that there would be no direct impact on great white shark foraging habitat, potentially an improvement in water quality and little potential for Great White Sharks to occur in the area, there are unlikely to be any significant impacts to the species.

Grey Nurse Shark - East Coast Population (*Carcharias taurus*)

Conservation Status:

NC Act – Endangered
EPBC Act – Critically Endangered

Species Profile:

Grey Nurse Sharks have a broad inshore distribution, primarily in sub-tropical to cool temperate waters around the main continental landmasses. In Australia, Grey Nurse Sharks have been regularly reported from Mooloolaba in southern Queensland around most of the southern half of the continent (excluding the Great Australian Bight), and northward to Shark Bay in Western Australia. The Grey Nurse Shark has been recorded as far north as Cairns in the east, the North West Shelf in the west, and also in the Arafura Sea. The distribution of the eastern population is now confined to coastal waters off southern Queensland and the entire New South Wales coast.

Additional details:
http://www.environment.gov.au/coasts/publications/grey-nurse-plan/pubs/greynurseshark

Critical Habitat Resources:

Grey Nurse Sharks are often observed resting just above the sea bed in or near deep sandy-bottomed gutters or rocky caves in the vicinity of inshore rocky reefs and islands. At times, particularly at night they move away to forage in other areas that may include various benthic habitats in coastal waters and estuaries. The lower section of the Caboolture River and adjacent area of Moreton Bay would be potentially be a foraging area. The diet of adults consists of a wide range of bony fishes such as jewfish and kingfish, other sharks and rays, squids, crabs and lobsters.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is a low probability of occurrence at this site given the habitat preference of this species. The tidal section of the Caboolture River may be suitable foraging habitat for Grey Nurse Sharks only very occasionally.

Recognised Threats and Potential Development Impact(s):

The recognised major threats to the recovery of grey nurse sharks include:

- incidental capture by commercial and recreational fisheries;
- shark control activities; and
- ecotourism.

The proposed development would not result in any of the threats listed above. Moreover, the development would, however, have potential to affect potential foraging areas of Grey Nurse Sharks if it were to degrade the ecology and potential food source of sharks.

Proposed Impact Mitigation Measures:

The design of the project and implementation of an environmental management plan would ensure that habitats in the Caboolture River were maintained and improved, thus benefiting coastal ecology and the environment of Grey Nurse Sharks in general.

Likelihood of Significant Impacts:

Given that there would be no direct impact on Grey Nurse Shark foraging habitat and potentially an improvement in water quality, there are unlikely to be any significant impacts to the east coast population.

MIGRATORY TERRESTRIAL SPECIES

BIRDS

Little Tern (*Sterna albifrons*)

Conservation Status:

NC Act – Endangered
EPBC Act – Migratory

Species Profile:

This species migrates from Asia to Australia each year and establishes breeding colonies along the east Australian coastline, from Cape York to Tasmania. Throughout this range it is primarily encountered in coastal environments. The species breeds on undisturbed, unvegetated sites near estuaries and adjacent fresh water lakes, on estuarine and continental islands and on coral cays. Nesting occurs between the high tide mark and shore vegetation.

Additional details:
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10769

Critical Habitat Resources:

Coastal estuaries are considered to be important breeding site habitats for this species.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the habitat requirements of the Little Tern, there is a moderate probability that this species will occur at the site, given the criteria. The NEBP occurs in close proximity to Moreton Bay. It is possible this species flies over the subject site or occurs as a short term vagrant.

Recognised Threats and Potential Development Impact(s):

Anthropological activities affecting flood levels or hydrological regimes resulting in the flooding of nesting sites.
Disturbance to coastal nesting and feeding as a result of increased traffic near roosting sites.
Increased activity from domestic and feral animals, including direct predation on an individual or its eggs.

Proposed Impact Mitigation Measures:

Undertake feral animal control programs.
Reduce anthropologic interaction with nesting and roosting sites through erection of barriers.
Provide interpretative signage to advise people of the value and risk associated with the species.

Likelihood of Significant Impacts:

Low – The areas where this species may occur are intended to be retained as conservation areas.

Eastern Curlew (*Numenis madagascariensis*)

Conservation Status:

NC Act – Rare
EPBC Act – Migratory

Species Profile:

This species is a non-breeding summer resident of the Australian coastline, where it is usually encountered around estuaries, salt-marshes, mudflats and sandy beaches. Two important habitat types exist for this species, one within the tidal zone and the other above it. Majority of birds leave Australia over the period of April to May and return to their northern hemisphere breeding grounds.

Additional details:
http://www.epa.qld.gov.au/nature_conservation/wildlife/az_of_animals/eastern_curlew/

Critical Habitat Resources:

Estuaries, mudflats, mangroves, and sandy beaches are all important habitats for this species. Intertidal zones and zones above the tidal areas are both important habitat types for the Eastern Curlew.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is a moderate probability of occurrence of the Eastern Curlew at this site given the species habitat requirements. The site is located within the Moreton Bay region and this species is likely to travel some distance inland and would intermittently occur on the subject site.

Recognised Threats and Potential Development Impact(s):

Loss of wetland habitat and feeding resources.
Impacts associated with anthropological activity which disturbs roosting and feeding sites.

Proposed Impact Mitigation Measures:

Best practice storm water management.
Protect important habitat resources.
Provide interpretative signage to advise people of the value and risk associated with the species.

Likelihood of Significant Impacts:

Low – The NEBP will not have any activity that occurs immediately adjacent to Moreton Bay. The dredging of the channel to the Caboolture River might create some issues in regards to levels of disturbance to species utilising Moreton Bay for the marina access to and NEBP, however this is not the commencement of an new activity and currently does not create any impacts

Cotton Pygmy-goose (*Nettapus coromandelianus*)

Conservation Status:

NC Act – Rare
EPBC Act – Migratory

Species Profile:

The Cotton Pygmy-goose is a surface feeder generally found in freshwater lakes, swamps, dams and lagoons that are vegetated. This species utilizes hollows within standing, dead trees, that are close to water, as roosting sites. Although its distribution was once along the eastern coastline of Australia from Cape York to southern New South Wales, it is now believed uncommon in Queensland.

Additional details:
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10557

Critical Habitat Resources:

Vegetated areas close to freshwater sources are required habitat for the Cotton Pygmy-goose.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is a moderate probability that this species will occur at this site, given the habitat requirements. The species had records from EPA database indicating that it has been observed previously within the immediate region of the site and there is known habitat supporting the characteristics required by this species. The EPBC database shows that the species or species habitat is known to occur within the area

Recognised Threats and Potential Development Impact(s):

Loss of wetland habitat and feeding resources.
Impacts associated with anthropological activity which disturbs roosting and feeding sites.

Proposed Impact Mitigation Measures:

Best practice storm water management.
Protect important habitat resources.
Provide interpretative signage to advise people of the value and risk associated with the species.

Likelihood of Significant Impacts:

Low – The NEBP will not have any activity that occurs immediately adjacent to Moreton Bay. The dredging of the channel to the Caboolture River might create some issues in regards to levels of disturbance to species utilising Moreton Bay for the marina access to and NEBP, however this is not the commencement of an new activity and currently does not create any impacts

Great Egret (*Ardea alba*)

Conservation Status:

NC Act – No status
EPBC Act – Migratory

Species Profile:

Great Egrets occur throughout most of the world. They are common throughout Australia, with the exception of the arid areas. The bird's overall plumage is white, and, for most of the year, when not breeding, the bill and facial skin are yellow which turn to black and green when breeding. The preferred habitats include shallow water, but also occur in a variety of wetter habitats including damp grasslands, estuaries, waterways, creeks and rivers. The species will feed on molluscs, amphibians, aquatic insects, small reptiles, crustaceans and occasionally other small animals, but fish are the primary resource in its diet.

Critical Habitat Resources:

Floodwaters, rivers, shallows of wetlands, intertidal mudflats

Site Observations/Habitat Values:

Site Observations:	√	EPA database record:	√	DEWR database record:	√

According to the criteria, there is a very high probability of occurrence for this species on the site given its habitat requirements. The site supports a variety of habitats consistent with the utilised by the species and was observed during field assessments.

Recognised Threats and Potential Development Impact(s):

Loss of wetland habitat and feeding resources.
Impacts associated with anthropological activity which disturbs roosting and feeding sites.

Proposed Impact Mitigation Measures:

Best practice storm water management.
Protect important habitat resources.
Provide interpretative signage to advise people of the value and risk associated with the species

Likelihood of Significant Impacts:

Low - The NEBP is unlikely to have any long term adverse impacts on this species. The habitat values that are present are intended to be retained within open space and conservation areas and best practice stormwater management is intended.

Cattle Egret (*Ardea ibis*)

Conservation Status:

NC Act –Common
EPBC Act – Migratory

Species Profile:

This species is widespread throughout the world, including Australia. Most numerous in the north and east, but recorded in all states. The Cattle Egret is usually seen in small groups on grazing land, stalking through the grass for large insects. It frequently perches on fence posts or the backs of grazing animals.

Critical Habitat Resources:

Pasture among stock, occasionally shallow wetlands.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements. There are numerous habitats within the region that may be influenced upon by the NEBP including grasslands grazed by stock, freshwater streams and brackish water areas.

Recognised Threats and Potential Development Impact(s):

Loss of wetland habitat and feeding resources.
Impacts associated with anthropological activity which disturbs roosting and feeding sites.

Proposed Impact Mitigation Measures:

Best practice storm water management.
Protect important habitat resources.
Provide interpretative signage to advise people of the value and risk associated with the species

Likelihood of Significant Impacts:

Low - The NEBP is unlikely to have any long term adverse impacts on this species. The habitat values that are present are intended to be retained, although with the removal of livestock these values may change, however wetlands and grasslands will be maintained within open space and conservation areas and best practice stormwater management is intended.

Ruddy turnstone (*Arenaria interpres*)

Conservation Status:

NC Act - Common
EPBC Act – Migratory

Species Profile:

The Ruddy Turnstone is a migratory species which breeds in the high Arctic and migrates to all southern continents. It occurs usually within Australia from August to April. It is found throughout the entire Australian coastline but is more often found along the eastern coast of Queensland where its preferred habitat, tidal reefs and pools, weed covered rocks and pebbly, shelly and sandy shores, are more prominent. It occasionally can be observed inland on various forms of shallow waters. These species are generalists in their diet eating anything they can find under rocks, pebbles or seaweed, this includes eggs of smaller colonial terns.

Critical Habitat Resources:

Tidal reefs and pools, weed covered rocks and pebbly, shelly and sandy shores.

Site Observations/Habitat Values:

Site Observations:	√	EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements. There are numerous habitats within the region that may be influenced upon by the NEBP.

Recognised Threats and Potential Development Impact(s):

Loss of marine and tidal wetlands.
Pollution to tidal wetlands and estuaries.
Increased anthropological impacts as a result of increased marine traffic.
Feral animal predation.

Proposed Impact Mitigation Measures:

Remove feral cats and pigs.
Best practice stormwater management.
Maintain, buffer and enhance any tidal mudflats or wetlands.

Likelihood of Significant Impacts:

Low – The NEBP may contribute to increased marine traffic and dredging within the channel leading into the Caboolture River. However this activity is not being introduced with the development and has occurred previously along this channel. The previous activity has not had any detrimental long term impacts upon adjacent important shorebird habitat.

Curlew Sandpiper (*Calidris ferruginea*)

Conservation Status:

NC Act - Common
EPBC Act – Migratory

Species Profile:

The Curlew Sandpiper is a small to medium-sized wader occurring across a broad range including Siberia and Alaska. The species occurs across a range of habitats within Australia in both coastal and inland areas. It has a long, black bill with a down-curved end and black legs and feet. It occurs within Australia on intertidal mudflats of estuaries, lagoons, mangroves, as well as beaches, rocky shores and around lakes, dams and floodwaters. The Curlew Sandpiper feeds on insects and their larvae when breeding. Otherwise, it feeds on small marine invertebrates, especially polychaete worms.

Critical Habitat Resources:

Intertidal mudflats of estuaries, lagoons, mangroves, as well as beaches, rocky shores and around lakes, dams and floodwaters.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements. There are numerous habitats both within and adjacent to the NEBP which support characteristics consistent with this species requirements.

Recognised Threats and Potential Development Impact(s):

Loss of marine and tidal wetlands.
Pollution to tidal wetlands and estuaries.
Increased anthropological impacts as a result of increased marine traffic.
Feral animal predation.

Proposed Impact Mitigation Measures:

Remove feral cats and pigs.
Best practice stormwater management.
Maintain, buffer and enhance any tidal mudflats or wetlands.

Likelihood of Significant Impacts:

Low – The NEBP may contribute to increased marine traffic and dredging within the channel leading into the Caboolture River. However this activity is not being introduced with the development and has occurred previously along this channel. The previous activity has not had any detrimental long term impacts upon adjacent important shorebird habitat.

Mongolian Plover (*Charadrius mongolus*)

Conservation Status:

NC Act - Common
EPBC Act – Migratory

Species Profile:

This species occurs throughout the world with breeding in Siberia. The species is a regular migrant to Australia and New Zeeland. The Mongolian Plover is a medium-sized plover with grey upperparts, white under parts, and bright rust-brown breast band and nape. It occurs around the coastlines of Australia usually found in tidal mudflats and sand flats, gently sloping sandy and shelly beaches, salt marshes, atolls and other coastal habitats. Its diet consists primarily of insects, crustaceans and annelid worms.

Critical Habitat Resources:

Coastlines, mudflats, sand flats, gently sloping sandy and shelly beaches.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is moderate probability of occurrence for this species on the site given its habitat requirements. There are numerous habitats both within and adjacent to the NEBP which support characteristics consistent with this species requirements.

Recognised Threats and Potential Development Impact(s):

Loss of marine and tidal wetlands.
Pollution to tidal wetlands and estuaries.
Increased anthropological impacts as a result of increased marine traffic.
Feral animal predation.

Proposed Impact Mitigation Measures:

Remove feral cats and pigs.
Best practice stormwater management.
Maintain, buffer and enhance any tidal mudflats or wetlands.

Likelihood of Significant Impacts:

Low – The NEBP may contribute to increased marine traffic and dredging within the channel leading into the Caboolture River. However this activity is not being introduced with the development and has occurred previously along this channel. The previous activity has not had any detrimental long term impacts upon adjacent important shorebird habitat.

Latham's Snipe (*Gallinago hardwickii*)

Conservation Status:

NC Act – No Status
EPBC Act – Migratory

Species Profile:

Latham's Snipe is a non-breeding migrant to the south east of Australia including Tasmania. Latham's Snipe is the largest snipe in Australia, with brown plumage. The bill is long and straight, the wings short and pointed and the tail long. Latham's Snipe are seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration where their primary diet consists of seeds and other plant material (mainly from species in families such as Cyperaceae, Poaceae, Juncaceae, Polygonaceae, Ranunculaceae and Fabaceae), and on invertebrates including insects, earthworms and spiders and occasionally molluscs, isopods and centipedes.

Critical Habitat Resources:

Wet grassland, open wooded wetlands supporting Cyperaceae, Poaceae, Juncaceae, Polygonaceae, Ranunculaceae and Fabaceae species.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements. There are numerous habitats both within and adjacent to the NEBP which support characteristics consistent with this species requirements.

Recognised Threats and Potential Development Impact(s):

Loss of marine and tidal wetlands.
Pollution to tidal wetlands and estuaries.
Increased anthropological impacts as a result of increased marine traffic.
Feral animal predation.

Proposed Impact Mitigation Measures:

Remove feral cats and pigs.
Best practice stormwater management.
Maintain, buffer and enhance any tidal mudflats or wetlands.

Likelihood of Significant Impacts:

Low – The NEBP may contribute to increased marine traffic and dredging within the channel leading into the Caboolture River. However this activity is not being introduced with the development and has occurred previously along this channel. The previous activity has not had any detrimental long term impacts upon adjacent important shorebird habitat.

Grey-tailed Tattler (*Heteroscelus brevipes*)

Conservation Status:

NC Act - Common
EPBC Act – Migratory

Species Profiles:

This species is also a non-breeding summer resident of the Australian coastline, where they are encountered around estuaries, tidal mudflats and less frequently on exposed beaches. The Grey-tailed Tattler is an elegant species with a uniform grey back and white belly. The majority of the migrant population departs Australia over the period from April to May and return to their northern hemisphere breeding grounds. These birds forage on the ground or water, picking up food by sight. They eat insects, crustaceans and other invertebrates.

Critical Habitat Resources:

Estuaries, tidal mudflats, mangroves, wave-washed rocks, and reefs, and shallow water margins.

Site Observations/Habitat Values:

Site Observations:	√	EPA database record:	√	DEWR database record:	√

According to the criteria, there is a very high probability of occurrence for this species on the site given its habitat requirements. There are numerous habitats both within and adjacent to the NEBP which support characteristics consistent with this species requirements and there were observations made during field assessment.

Recognised Threats and Potential Development Impact(s):

Loss of marine and tidal wetlands.
Pollution to tidal wetlands and estuaries.
Increased anthropological impacts as a result of increased marine traffic.
Feral animal predation.

Proposed Impact Mitigation Measures:

Remove feral cats and pigs.
Best practice stormwater management.
Maintain, buffer and enhance any tidal mudflats or wetlands.

Likelihood of Significant Impacts:

Low – The NEBP may contribute to increased marine traffic and dredging within the channel leading into the Caboolture River. However this activity is not being introduced with the development and has occurred previously along this channel. The previous activity has not had any detrimental long term impacts upon adjacent important shorebird habitat.

Bar-tailed Godwit (*Limosa lapponica*)

Conservation Status:

NC Act - Common
EPBC Act – Migratory

Species Profile:

Bar-tailed Godwits arrive in Australia each year in August from breeding grounds in the northern hemisphere particularly north-east Siberia and north-west Alaska. The birds migrate to Indonesia, Papua New Guinea and Australia. They are quite large waders ranging in size from 38-46cm and generally are mottled brown above and lighter and more uniform buff below. It has dull white under wings, and a long, slightly upturned bill. Bar-tailed Godwits inhabit tidal mudflats, beaches and mangroves. They are common in coastal areas around Australia. Bar-tailed Godwits feed on molluscs, worms and aquatic insects.

Critical Habitat Resources:

Tidal mudflats, beaches and Mangroves.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements. There are numerous habitats both within and adjacent to the NEBP which support characteristics consistent with this species requirements.

Recognised Threats and Potential Development Impact(s):

Loss of marine and tidal wetlands.
Pollution to tidal wetlands and estuaries.
Increased anthropological impacts as a result of increased marine traffic.
Feral animal predation.

Proposed Impact Mitigation Measures:

Remove feral cats and pigs.
Best practice stormwater management.
Maintain, buffer and enhance any tidal mudflats or wetlands.

Likelihood of Significant Impacts:

Low – The NEBP may contribute to increased marine traffic and dredging within the channel leading into the Caboolture River. However this activity is not being introduced with the development and has occurred previously along this channel. The previous activity has not had any detrimental long term impacts upon adjacent important shorebird habitat.

Whimbrel (*Numenis phaeopus*)

Conservation Status:

NC Act - Common
EPBC Act – Migratory

Species Profile:

The Whimbrel is a medium-sized curlew, which is mainly streaked brown, with twin dark streaks along the crown and bill. The body is white below, with coarsely streaked brown upperparts. This species is common across northern Australia and uncommon to rare further south. Breeding grounds are in the northern hemisphere from central Siberia to Iceland. Whimbrels are found mainly on the coast, on tidal and estuarine mudflats, especially near mangroves where they feed on worms, crustaceans and occasionally fish and nestling birds.

Critical Habitat Resources:

Estuaries, salt-marshes, mudflats and sandy beaches.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements. There are numerous habitats both within and adjacent to the NEBP which support characteristics consistent with this species requirements.

Recognised Threats and Potential Development Impact(s):

Loss of marine and tidal wetlands.
Pollution to tidal wetlands and estuaries.
Increased anthropological impacts as a result of increased marine traffic.
Feral animal predation.

Proposed Impact Mitigation Measures:

Remove feral cats and pigs.
Best practice stormwater management.
Maintain, buffer and enhance any tidal mudflats or wetlands.

Likelihood of Significant Impacts:

Low – The NEBP may contribute to increased marine traffic and dredging within the channel leading into the Caboolture River. However this activity is not being introduced with the development and has occurred previously along this channel. The previous activity has not had any detrimental long term impacts upon adjacent important shorebird habitat.

Pacific Golden Plover (*Pluvialis fulva*)

Conservation Status:

NC Act - Common
EPBC Act - Migratory

Species Profile:

The Pacific Golden Plover is a slender upright shorebird with a rounded head, slim neck, short fine bill and long legs. In breeding plumage, the underparts from the tail to the chin including the eye are black with white flecking on the tail. The upperparts, crown and wings are golden brown with white and black flecks on the wings.. When not breeding, it has a broad, buff brown to white eyebrow and the upperparts are duller, being golden brown with white spots. The Pacific Golden Plover breeds on the Arctic tundra in western Alaska. It is a common migrant in Australia from August to April where is can be found on muddy, rocky and sandy wetlands, shores, paddocks, salt marsh, coastal golf courses, estuaries and lagoons where its dietary requirements of molluscs, insects, worms, crustaceans and lizards can be found.

Critical Habitat Resources:

Muddy, rocky and sandy wetlands, shores, paddocks, salt marsh, estuaries and lagoons.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements. There are numerous habitats both within and adjacent to the NEBP which support characteristics consistent with this species requirements.

Recognised Threats and Potential Development Impact(s):

Loss of marine and tidal wetlands.
Pollution to tidal wetlands and estuaries.
Increased anthropological impacts as a result of increased marine traffic.
Feral animal predation.

Proposed Impact Mitigation Measures:

Remove feral cats and pigs.
Best practice stormwater management.
Maintain, buffer and enhance any tidal mudflats or wetlands.

Likelihood of Significant Impacts:

Low – The NEBP may contribute to increased marine traffic and dredging within the channel leading into the Caboolture River. However this activity is not being introduced with the development and has occurred previously along this channel. The previous activity has not had any detrimental long term impacts upon adjacent important shorebird habitat.

Terek sandpiper (*Xenus cinereus*)

Conservation Status:

NC Act – No Status
EPBC Act – Migratory

Species Profile:

The Terek Sandpiper is a small sandpiper with short orange legs. The long slightly up-turned bill is orange at the base. The body is brownish-grey above and on the sides of the breast, and white below. This species is more common on the northern and eastern Australian coasts than in the south, but large populations are considered uncommon. Terek Sandpipers are found on the coast in mangrove swamps, tidal mudflats and the seashore. The primary diets consists of crustaceans and insects, adding seeds, molluscs and spiders in their breeding ground

Critical Habitat Resources:

Tidal mudflats, estuaries, shores and reefs of islands, coastal swamps.

Site Observations/Habitat Values:

Site Observations:		EPA database record:		DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements. There are numerous habitats both within and adjacent to the NEBP which support characteristics consistent with this species requirements.

Recognised Threats and Potential Development Impact(s):

Loss of marine and tidal wetlands.
Pollution to tidal wetlands and estuaries.
Increased anthropological impacts as a result of increased marine traffic.
Feral animal predation.

Proposed Impact Mitigation Measures:

Remove feral cats and pigs.
Best practice stormwater management.
Maintain, buffer and enhance any tidal mudflats or wetlands.

Likelihood of Significant Impacts:

Low – The NEBP may contribute to increased marine traffic and dredging within the channel leading into the Caboolture River. However this activity is not being introduced with the development and has occurred previously along this channel. The previous activity has not had any detrimental long term impacts upon adjacent important shorebird habitat.

White-bellied Sea-Eagle (*Haliaeetus leucogaster*)

Conservation Status:

NC Act - Common
EPBC Act – Migratory

Species Profile:

The White-bellied Sea-Eagle is the second largest raptor found in Australia, it has white on the head, rump and underparts and dark grey on the back and wings. In flight the black flight feathers on the wings are easily seen when the bird is viewed from below. The large, hooked bill is grey with a darker tip, and the eye is dark brown. They form permanent pairs that inhabit territories throughout the year in coastal and near coastal areas of Australia. Aquatic animals form the primary source of food for this species diet, including sea snakes, fish and turtles and occasionally birds and mammals.

Critical Habitat Resources:

Large Rivers, fresh and saline lakes, coastal seas.

Site Observations/Habitat Values:

Site Observations:	√	EPA database record:	√	DEWR database record:	√

According to the criteria, there is a very high probability of occurrence for this species on the site given its habitat requirements. The species was observed on site and habitat resources that are required for this species are present throughout and adjacent to the site.

Recognised Threats and Potential Development Impact(s):

Loss of roosting and nesting habitat.
Reduction in food resources.
Anthropologic impacts to nesting trees or sites.

Proposed Impact Mitigation Measures:

Locate and buffer any potential nests or nesting sites.
Develop a Fauna Management Plan to protect the species during and following the development.
Provide interpretive signage for residents to understand the value of the species.

Likelihood of Significant Impacts:

Low – The NEBP will retain habitat for this species within open space and conservation areas. Nests or roosting trees will be protected and the proximity to Moreton Bay and Caboolture River will ensure that food resources are kept available.

White-throated Needletail (*Hirundapus caudacutus*)

Conservation Status:

NC Act - Common
EPBC Act – Migratory

Species Profile:

The White-throated Needletail is predominantly grey-brown, glossed with green and the long curved wings have white markings. The tail is short and square, with the protruding feather shafts giving a spiky appearance. These species are predominantly fly over species occurring across a range of habitats in eastern Australia; however they may roost in trees intermittently. Flying insects, such as termites, ants, beetles and flies are the primary resources for the diets of these birds.

Critical Habitat Resources:

Aerial across variety of habitats.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements. This species occurs in many coastal species but is not often observed roosting or landing. It is likely this species intermittently occurs flying over the site.

Recognised Threats and Potential Development Impact(s):

Not applicable.

Proposed Impact Mitigation Measures:

Not applicable

Likelihood of Significant Impacts:

None – The White Throated Needletail is a flyover species only and is unlikely to be impacted by any development on this site.

Black-faced Monarch (*Monarcha melanopsis*)

Conservation Status:

NC Act – Common
EPBC Act – Migratory

Species Profile:

The Black-faced Monarch is found along the coast of eastern Australia, becoming less common further south. It has a distinctive black face that does not extend across the eyes, grey upperparts, wings and upper breast, contrasting with a rufous belly. This species is found in rainforests, eucalypt woodlands, coastal scrub and damp gullies. It may be found in more open woodland when migrating. The Black-faced Monarch forages for insects among foliage, or catches flying insects on the wing.

Critical Habitat Resources:

Rainforest, Wet Eucalypt Forest and Mangroves along coastal regions.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements. The species is listed in both the EPA and the EPBC databases and is likely to occur within vegetated habitats within the site.

Recognised Threats and Potential Development Impact(s):

Habitat loss.
Predation by feral animals.
Anthropological impacts on nesting areas.

Proposed Impact Mitigation Measures:

Remove feral animals.
Encourage owners to keep domestic animals inside at night.
Retain nesting and feeding habitat.

Likelihood of Significant Impacts:

Low – NEBP will not have any significant impact on this species. Habitat will be retained within conservation and open space areas and other management strategies will be employed to remove feral animals and minimise harm from domestic animals.

Spectacled Monarch (*Monarcha trivirgatus*)

Conservation Status:

NC Act – Common
EPBC Act – Migratory

Species Profile:

The Spectacled Monarch is found in coastal north-eastern and eastern Australia, from Cape York, Queensland to Port Stephens, New South Wales It is a small flycatcher that is blue-grey above, with a black face mask that extends across both eyes, rufous breast, white underparts and a black tail. The Spectacled Monarch prefers thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves where it feeds on insects, foraging mostly below the canopy in foliage and on tree trunks or vines.

Critical Habitat Resources:

Wet Forests and Mangroves.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements. Whilst no observations were made there were numerous records in the EPA database and habitat was observed to be present.

Recognised Threats and Potential Development Impact(s):

Habitat loss.
Predation by feral animals.
Anthropological impacts on nesting areas.

Proposed Impact Mitigation Measures:

Remove feral animals.
Encourage owners to keep domestic animals inside at night.
Retain nesting and feeding habitat.

Likelihood of Significant Impacts:

Low – NEBP will not have any significant impact on this species. Habitat will be retained within conservation and open space areas and other management strategies will be employed to remove feral animals and minimise harm from domestic animals.

Rainbow Bee-eater (*Merops ornatus*)

Conservation Status:

NC Act – Common
EPBC Act – Migratory

Species Profile:

The Rainbow Bee-eater is found throughout mainland Australia, as well as eastern Indonesia, New Guinea and, rarely, the Solomon Islands. In Australia it is widespread, except in desert areas. This species is a brilliantly coloured bird, with a long slim curved bill and a long tail with distinctive tail-streamers. The upperparts are green, with the flight feathers coppery and black tipped. The under wings are bright orange, with a black edge and the head is often a cap of yellow. The Rainbow Bee-eater is most often found in open forests, woodlands and shrublands, and cleared areas, usually near water. Rainbow Bee-eaters eat insects, mainly catching bees and wasps, as well as dragonflies, beetles, butterflies and moths.

Critical Habitat Resources:

Temperate to tropical woodland, savannah, forest edges, farmland.

Site Observations/Habitat Values:

Site Observations:	√	EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements.

Recognised Threats and Potential Development Impact(s):

Habitat loss.
Predation by feral animals.
Anthropological impacts on nesting areas.

Proposed Impact Mitigation Measures:

Remove feral animals.
Encourage owners to keep domestic animals inside at night.
Retain nesting and feeding habitat.

Likelihood of Significant Impacts:
Low – NEBP will not have any significant impact on this species. Habitat will be retained within conservation and open space areas and other management strategies will be employed to remove feral animals and minimise harm from domestic animals.

Rufous Fantail (*Rhipidura rufifrons*)

Conservation Status:

NC Act – Common
EPBC Act – Migratory

Species Profile:

The Rufous Fantail is found in northern and eastern coastal Australia, being more common in the north. It is a small, active bird which has a distinctive reddish brown rump and continuously fanned tail. The Rufous Fantail is found in rainforest, dense wet forests, swamp woodlands and mangroves, preferring deep shade, and is often seen close to the ground. During migration, it may be found in more open habitats or urban areas. It generally feeds on insects, which it gleans from the middle and lower levels of the canopy.

Critical Habitat Resources:

Rainforest, dense wet forests, swamp woodlands and mangroves.

Site Observations/Habitat Values:

Site Observations:	√	EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements.

Recognised Threats and Potential Development Impact(s):

Habitat loss.
Predation by feral animals.
Anthropological impacts on nesting areas.

Proposed Impact Mitigation Measures:

Remove feral animals.
Encourage owners to keep domestic animals inside at night.
Retain nesting and feeding habitat.

Likelihood of Significant Impacts:

Low – NEBP will not have any significant impact on this species. Habitat will be retained within conservation and open space areas and other management strategies will be employed to remove feral animals and minimize harm from domestic animals.

Satin Flycatcher (*Myiagra cyanoleuca*)

Conservation Status:

NC Act – Common
EPBC Act – Migratory

Species Profile:

The Satin Flycatcher is found along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia. It is a small blue-black and white bird with a small crest. The Satin Flycatcher is found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests. The Satin Flycatcher takes insects on the wing, foraging actively from perches in the mid to upper canopy

Critical Habitat Resources:

Heavily forested gullies near watercourses.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is high probability of occurrence for this species on the site given its habitat requirements.

Recognised Threats and Potential Development Impact(s):

Habitat loss.
Predation by feral animals.
Anthropological impacts on nesting areas.

Proposed Impact Mitigation Measures:

Remove feral animals.
Encourage owners to keep domestic animals inside at night.
Retain nesting and feeding habitat.

Likelihood of Significant Impacts:

Low – NEBP will not have any significant impact on this species. Habitat will be retained within conservation and open space areas and other management strategies will be employed to remove feral animals and minimize harm from domestic animals.

MIGRATORY AQUATIC SPECIES

MAMMALS

Dugong (*Dugong dugon*)

Conservation Status:

NC Act – Vulnerable
EPBC Act – Migratory

Species Profile:

Dugongs are a predominantly tropical species and rarely travel into temperate waters. Dugongs are highly migratory, and may travel between Australia and other neighbouring countries. Populations exist throughout northern Australia between Moreton Bay and Shark Bay in the west. The population in Moreton Bay is geographically isolated from the closest population, Hervey Bay,

Additional details:
http://www.environment.gov.au/coasts/species/dugongs/index.html
Lanyon, J.M. (2003). Distribution and abundance of dugongs in Moreton Bay, Queensland, Australia. Wildlife Research, 30 (397-409).

Critical Habitat Resources:

Dugongs live and breed in the shallow coastal waters where seagrass (their food) is found and where there is protection from large waves and storms. They surface only to breathe. Moreton Bay supports a large population of Dugongs of between about 500 and 1200 individuals. However, recent surveys found that only a small proportion of the population (i.e. generally a few individuals only) occurs in the area of Moreton Bay adjacent to the Caboolture River. The majority of the population occurs in other parts of Moreton Bay where seagrass is prevalent.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is a moderate probability of occurrence at this site given the habitat preference of this species. The tidal section of the Caboolture River and adjacent area of Moreton Bay may be a suitable habitat.

Recognised Threats and Potential Development Impact(s):

Threats to Dugongs with potential to be associated with the proposed development are:

- loss of habitat; and
- boat strike.

Proposed Impact Mitigation Measures:

Dugongs are slow-moving and have little protection from vessels if they are moving rapidly. In regard to boat strike, opportunities for awareness raising and educative activities with new boat users associated with the proposed marina could be included in the EMP for the development. Awareness and speed limit signage would ensure that personal watercraft would not be driven in a way or at a speed that could reasonably be expected to result in the striking of a sea turtle.

Likelihood of Significant Impacts:

Given that there would be no direct impact on dugong foraging or breeding habitat, potentially an improvement in water quality and controls on the speed of vessels associated with the proposed marina, there are unlikely to be any significant impacts to this species.

Indo-Pacific Humpback Dolphin (*Sousa chinensis*)

Conservation Status:

NC Act – Rare
EPBC Act – Migratory

Species Profile:

This species has a range extending from southern Africa along the continental coastlines of the Indian Ocean, through southeast Asia to the South China Sea. In Australia, they have been recorded in tropical and subtropical coastal waters as far south as Coral Bay on the west coast and the Tweed River in the east. Large populations of Humpback Dolphins are thought to occur in Moreton Bay, with the species being more prevalent in the western and southern parts of the bay where there preferred habitat is more common.

Additional details:
Hale, P., Long, S. and Tapsall, A. (1998). Distribution and Conservation of Dephinids in Moreton Bay. *In*: Tibbetts, I.R., Hall, N.J., and Dennison, W.C. (eds). Moreton Bay and Catchment. School of Marine Science, University of Queensland, Brisbane, pp. 477-486.

Critical Habitat Resources:

The species primary habitat has been described as the shallow (<20 m) turbid waters near the mangrove and mudbank areas of estuaries, including the tidal reaches of rivers. Indo-Pacific Humpback Dolphins feed on pelagic shoaling fish including mullet (*Mugil* spp.) and Tailor (*Pomatomus salatrix*) and cephalopods.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is a moderate probability of occurrence at this site given the habitat preference of this species. The tidal section of the Caboolture River and adjacent area of Moreton Bay may be a suitable foraging habitat.

Recognised Threats and Potential Development Impact(s):

Possible threats to Indo-Pacific Humpback Dolphins that have potential to be associated with the proposed marina development are:

- scarcity of prey items;
- loss of habitat; and
- boat strike (some carcasses retrieved from Moreton Bay have had propeller scars).

Proposed Impact Mitigation Measures:

The design of the project and implementation of an environmental management plan would ensure that habitats in the Caboolture River were maintained and improved, thus benefiting coastal ecology and the environment of Indo-Pacific humpback dolphins in general.

In regard to boat strike, opportunities for awareness raising and educative activities with new boat users associated with the proposed marina could be included in the EMP for the development. Awareness and speed limit signage would ensure that personal watercraft would not be driven in a way or at a speed that could reasonably be expected to result in the striking of an Indo-Pacific humpback dolphin.

Likelihood of Significant Impacts:

Given that the direct impact to Indo-Pacific Humpback Dolphins would be minimal, potentially an improvement in water quality and controls on the speed of any vessels associated with the proposed marina, there are unlikely to be any significant impacts to Indo-Pacific Humpback Dolphins.

Irrawaddy dolphin (*Orcaella brevirostris*)

Conservation Status:

NC Act – Rare
EPBC Act – Migratory

Species Profile:

Irrawaddy Dolphins occur from the Bay of Bengal, through the Indo–Malay Archipelago to northern Australia; mainly in coastal waters but in some places up rivers. In Australia, they have are mostly reported in Western Australia north of and including Broome (18°S), the Northern Territory, and in Queensland, north of Gladstone (23°50'S). There have been some sightings in Moreton Bay.

Additional details:
Hale, P., Long, S. and Tapsall, A. (1998). Distribution and Conservation of Dephinids in Moreton Bay. *In*: Tibbetts, I.R., Hall, N.J., and Dennison, W.C. (eds). Moreton Bay and Catchment. School of Marine Science, University of Queensland, Brisbane, pp. 477-486.

Critical Habitat Resources:

Very little is known about Irrawaddy Dolphins but they are thought to have a similar habitat requirements to Humpback Indo-Pacific Dolphins (i.e. the species primary habitat is the shallow (<20 m) turbid waters near the mangrove and mudbank areas of estuaries, including the tidal reaches of rivers). This species typically feeds on fish, cephalopods and crustaceans.

Site Observations/Habitat Values:

Site Observations:		EPA database record:	√	DEWR database record:	√

According to the criteria, there is a moderate probability of occurrence at this site given the habitat preference of this species. The tidal section of the Caboolture River and adjacent area of Moreton Bay may be a suitable foraging habitat.

Recognised Threats and Potential Development Impact(s):

The potential threats to marine turtles that have potential to be associated with the proposed marina development are:

- loss/degradation of habitat, including noise pollution;
- loss of prey species; and
- boat strike.

Proposed Impact Mitigation Measures:

The design of the project and implementation of an environmental management plan would ensure that habitats in the Caboolture River were maintained and improved, thus benefiting coastal ecology and the environment of Irrawaddy Dolphins in general.

In regard to boat strike, opportunities for awareness raising and educative activities with new boat users associated with the proposed marina could be included in the EMP for the development. Awareness and speed limit signage would ensure that personal watercraft would not be driven in a way or at a speed that could reasonably be expected to result in the striking of an Irrawaddy Dolphin.

Likelihood of Significant Impacts:

Given that there would be no direct impact on Irrawaddy Dolphin foraging or nesting habitat, potentially an improvement in water quality, controls on the speed of any vessels associated with the proposed marina, and their rarity in areas south of Gladstone there are unlikely to be any significant impacts to Irrawaddy Dolphins.