



Browse LNG Precinct



Browse Liquefied Natural Gas Precinct Strategic Assessment Report

(Draft for Public Review)
December 2010

Appendix C-1

Browse LNG Development Migratory Bird Study,
James Price Point

BROWSE LNG DEVELOPMENT

Migratory Bird Study, James Price Point

Prepared for

WOODSIDE ENERGY LTD, Browse Business Unit



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BROWSE LNG DEVELOPMENT

MIGRATORY BIRD STUDY, JAMES PRICE POINT

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Title page photographs Four migratory bird species commonly recorded within the Study Area: clockwise from top left: Grey-tailed Tattler (*Tringa brevipes*); Rainbow Bee-eater (*Merops ornatus*); Red-necked Stint (*Calidris ruficollis*); and Lesser Crested Tern (*Sterna bengalensis*). [All images not subject to copyright, downloaded from open-source websites]



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EXECUTIVE SUMMARY

The Western Australian Department of State Development has identified James Price Point as the preferred location of a Liquefied Natural Gas Precinct in the Kimberley region of northern Western Australia.

A 'Scope of the Strategic Assessment' document has been prepared by the Department of State Development, to define the proposed studies and investigations required to inform the Strategic Assessment of the LNG Precinct. To support the Strategic Assessment, Woodside has identified the environmental studies and investigations required for the LNG Precinct area. As part of the Baseline Biological Studies and Investigations Program, Woodside required a Migratory Bird Study to be carried out to investigate the distribution and abundance of migratory bird species within the James Price Point coastal area.

This report presents the results and conclusions of the Migratory Bird Study for the James Price Point coastal area (the Study Area). The Study, which is a desktop exercise, is comprised of four key elements: 1) literature review; 2) database searches; 3) habitat analysis; and 4) regional assessment.

A total of 39 migratory bird species have been recorded within the Study Area. A list of these species is provided, which includes information on: their migratory status; their conservation listing under the EPBC Act, the Bonn Convention, CAMBA, JAMBA, ROKAMBA bilateral migratory bird agreements, and the WA Wildlife Conservation Act; preferred habitats, and data sources. Overall, the 10 most common migratory bird species recorded within the Study Area are: Common Tern, Greater Sand Plover, Lesser Crested Tern, Red-necked Stint, Rainbow Bee-eater, Little Tern, Grey-tailed Tattler, Red Knot, Sanderling, and Lesser Frigatebird.

All of the 39 species of migratory bird recorded in the Study Area are listed as both Migratory and Marine birds under the EPBC Act. None of these 39 species are listed Threatened species under the EPBC Act.

In addition to the 39 species known to occur, there are an additional 28 species of migratory bird that could potentially occur within the Study Area and surrounding marine and terrestrial environments. Of these, two species are listed Threatened species under the EPBC Act—the Painted Snipe (Vulnerable), and the Gouldian Finch (Endangered). Whilst the Painted Snipe could conceivably occur within the Study Area, it is very unlikely that the Gouldian Finch occurs in this area, as records of this species on the Dampier Peninsula are restricted to the extreme north of the Peninsula, south to Lombadina.

With the exception of the Osprey, all of the migratory bird species recorded in the Study Area are protected under the WA Wildlife Conservation Act.

Significantly, much of the coastline within the Study Area has a direct west-facing aspect and represents the most exposed shorelines along the western side of the Dampier Peninsula. The Study Area does not include any supratidal mudflats that would represent important foraging areas for migratory wading birds within the families Scolopacidae and Charadriidae. Nor does it include any mangals that would be important feeding and roosting habitat for a number of migratory bird species.

An analysis of habitat preferences for migratory birds on the Dampier Peninsula indicates that inshore seas, intertidal sand, reef and mudflats, beaches and coastal cliffs, and mangals represent the most important habitats for these species in the region. This is particularly the case for the Arctic-breeding shorebirds, as the western coastline of the Dampier Peninsula may represent the first landfall in northern Australia for many of these species as they complete their southern migration to the internationally significant feeding areas at Roebuck Bay and Eighty Mile Beach, south of Broome.

It is unlikely that the James Price Point coastal area (including Coulomb Point) includes any regionally significant habitat for migratory bird species. With respect to a number of habitat types that are important feeding and roosting areas for migratory birds (e.g. intertidal sand and mudflats, tidal creeks and mangals), it is probable that locations on the Dampier Peninsula both south and north of the Study Area include far more extensive areas of these habitats. For instance: Willie Creek and Barred Creek to the south; and Carnot Bay, Baldwin Creek, Camp Inlet, Beagle Bay, Tappers Inlet, Pender Bay, Chile Creek and Thomas Bay to the north.

Pindan woodland probably represents the second-most important habitat for migratory bird species within the James Price Point coastal area, after inshore seas, intertidal sand and reef flats, rocky outcrops, beaches and coastal cliffs. However, pindan woodland and scrubland is the vegetation type that predominates across the whole of the Dampier Peninsula, covering some 70% of the area.



Therefore, any migratory bird species exhibiting a preference for this type of habitat could be expected to be fairly widespread across the region.

The Study Area includes several small drainage basins that are subject to ephemeral freshwater flooding, ponding, or seepage, and are vegetated with Lardik and paperbarks. These ephemeral wetlands may provide habitat for some migratory bird species on a seasonal basis. However, they are not expected to host large or diverse bird assemblages, particularly as the areal extent of these swamps is very small, and the habitat type is well represented at other locations on the Dampier Peninsula.

Regionally, the James Price Point coastal area has to be regarded as relatively insignificant as a summer feeding site for migratory shorebirds compared to the internationally significant sites at Eighty Mile Beach and Roebuck Bay, to the south of Broome. Similarly, unlike the Lacepede Islands that are a nationally important nesting location for a number of migratory seabirds, the Study Area does not include breeding habitat for any migratory seabirds and hence has to be regarded as unimportant at a regional level.

Overall, the conclusion of this Migratory Bird Study is that the migratory bird population of the James Price Point coastal area comprises a suite of species that are widespread and well-represented on the Dampier Peninsula. Therefore, the migratory bird populations of this area can be considered to be of low conservation significance in a regional and international context.



1. INTRODUCTION

1.1 Background

The Western Australian (WA) Department of State Development (DSD) (formally the Northern Development Taskforce) has identified James Price Point as the preferred location of a Liquefied Natural Gas (LNG) Precinct in the Kimberley region of northern Western Australia. The Kimberley LNG Precinct encompasses the construction and operation of LNG processing facilities and associated infrastructure to be located in the vicinity of James Price Point, as determined by the site selection process undertaken by the DSD and WA State and Commonwealth Governments. The development is based on the recovery of hydrocarbons from the Browse Basin gas fields and involves construction and operation of facilities to process hydrocarbons into LNG and associated products, marine facilities and other associated infrastructure.

A 'Scope of the Strategic Assessment' document has been prepared by the DSD, to define the proposed studies and investigations required to inform the Strategic Assessment (SA) of the LNG Precinct (DSD 2009). Woodside Energy Limited (WEL) has been scoping a number of baseline biological studies, which will provide information for an Environmental, Social and Health Assessment (ESHA) of the LNG Precinct. The environmental approvals for the Browse downstream development will be obtained by WEL as the proponent on behalf of the Browse Development Joint Venture (JV) Partners, and run in parallel to approvals being obtained by the DSD for the common-user LNG precinct at James Price Point. It is anticipated that studies undertaken as part of the ESHA will support approval of WEL activities within the SA for the LNG Precinct development.

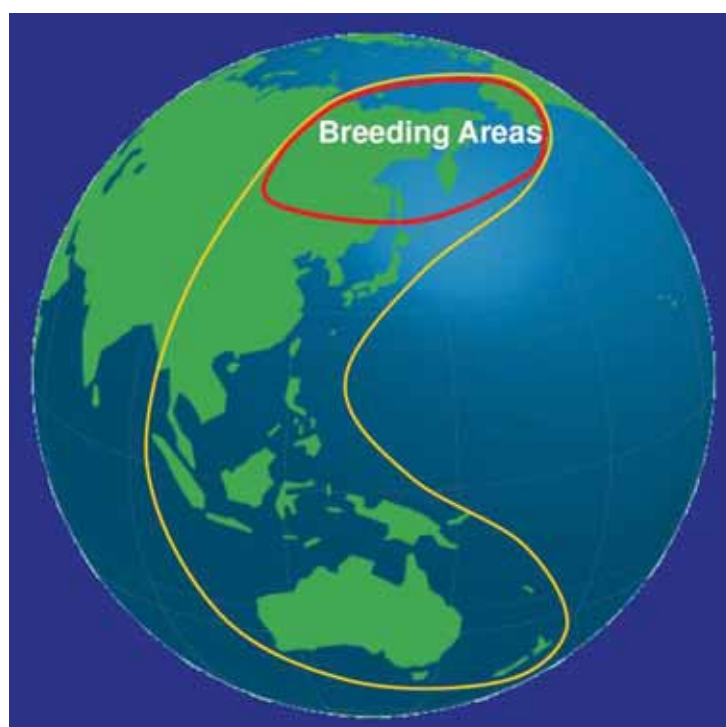
To support the SA for the Kimberley LNG Precinct, WEL has identified the environmental studies and investigations required for the James Price Point coastal area. As part of the Baseline Biological Studies and Investigations Program, WEL requires a Migratory Bird Study (study reference number DFS8 from *WEL KLNG Terms of Reference* document [WEL 2009]) to be carried out to investigate the distribution and abundance of migratory bird species within the James Price Point coastal area.

1.2 East Asian-Australasian Flyway

The East Asian-Australasian Flyway, which is one of eight major migratory bird flyways around the globe, extends from within the Arctic Circle in Russia and Alaska, southwards through East and South-east Asia, to Australia and New Zealand in the south, encompassing 22 countries (**Figure 1**). It is especially important for the millions of migratory waders or shorebirds that breed at sites in northern Asia and Alaska and spend the non-breeding season in South-east Asia and Australasia. Australia is the southern destination on the migration route for approximately two million of the five million shorebirds in the Flyway (Straw 2004; Bamford *et al.* 2008).

Thirty six of the fifty-four species of shorebirds that use the Flyway regularly visit Australia, arriving each year in the spring and spending the summer on coastal beaches, mudflats and shallow inland lakes, before departing in the autumn on their migration up to 13,000 km north through the countries of South-east Asia to breeding grounds in the Arctic tundra of the Russian Federation, Alaska and China (**Figure 1**) (Watkins 1993; Straw 2004). The northwest region of Western Australia is a first stopping point for many shorebird species on their migration south through the Flyway. Very limited information is available on precise migration routes within the Flyway—some shorebirds may migrate directly from northern staging sites to their southern wintering grounds, whereas others spread across a broad front when migrating southwards (Geering *et al.* 2007). To date, no attempts appear to have been made to map migratory bird routes at a regional scale within the Kimberley, and hence it is difficult to predict where these routes may lie in relation to the west coast of the Dampier Peninsula. The islands of the Kimberley, and the intertidal coastal environment and wetlands of the region, contain a number of important areas, not all of which have been identified, where species using the Flyway will congregate, feed and rest (DEC 2009).



Figure 1: East Asian-Australasian Flyway

1.3 Regional Significance

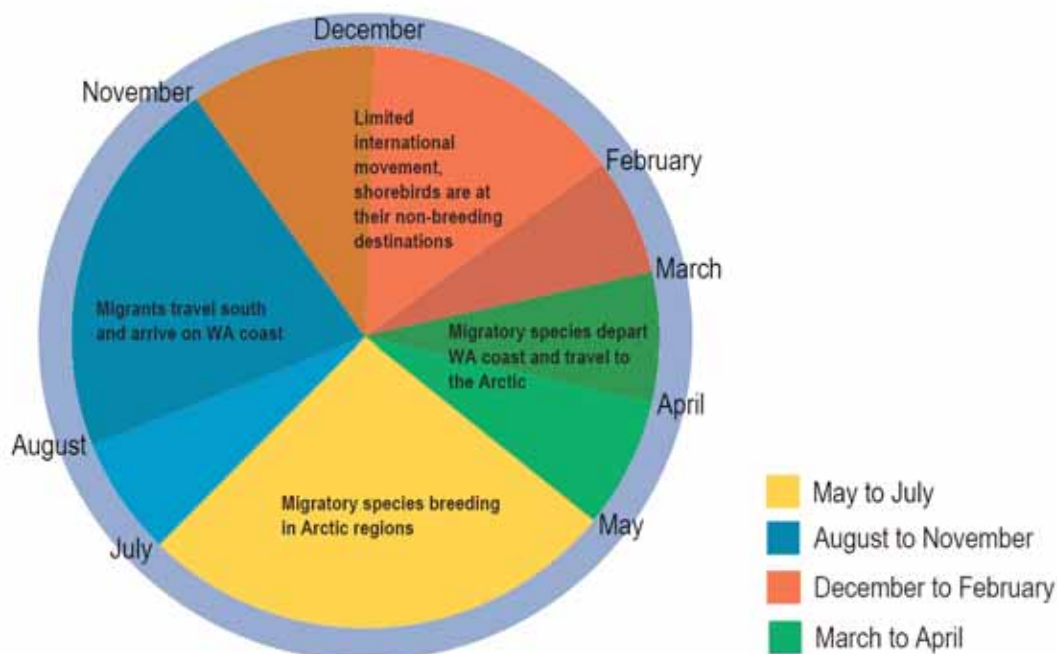
There are potentially dozens of Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed migratory shorebirds that utilize the various intertidal and terrestrial habitats of the Dampier Peninsula. Many of these species will be listed on international migratory bird agreements, such as CAMBA, JAMBA and ROKAMBA, and international conventions on migratory species (Convention on Migratory Species [CMS] or Bonn Convention). Significant numbers of migratory waders are likely to collect in suitable places on the Dampier Peninsula during the Austral spring, summer and autumn months, particularly during the peak periods for southward (September-October) and northward (March-April) migration (see **Figure 2**) of these species to and from the key feeding sites at Roebuck Bay and Eighty Mile Beach, to the south of Broome.

As the destination for hundreds of thousands of migratory shorebirds using the Flyway, Roebuck Bay and Eighty Mile Beach are the most important shorebird sites in northwest Australia. These two sites have received a great deal of attention and there is ongoing collaborative research on the invertebrate fauna and relationship with sea, shore and migratory birds (Wade and Hickey 2008; de Goeij *et al.* 2008; Piersma *et al.* 2006; Rogers *et al.* 2003). While Roebuck Bay studies have identified a high invertebrate and shorebird biomass and diversity, this research has not been repeated at other similar sites and it is not known whether this level of biodiversity and productivity is unique to Roebuck Bay or more widespread across the Kimberley (DEC 2009). Eighty Mile Beach and Roebuck Bay are considered of international significance given the numbers of birds that feed in these areas seasonally, and they are also listed Ramsar sites (Wetlands of International Importance). Long-term research programs have been active through Birds Australia (the Broome Bird Observatory), the Australian Wader Study Group (DEC 2009), and the Monitoring Yellow Sea Migrants in Australia (MYSMA) Project (Rogers *et al.* 2009).

The Lacepede Islands, which are located approximately 20 km offshore from the west coast of the Dampier Peninsula and 67 km north of James Price Point, support some of the largest Brown Booby (*Sula leucogaster*) colonies in Western Australia, with the number of breeding pairs on West Island and Middle Island estimated to be in the tens of thousands (DEWHA 2008). Other listed migratory seabirds also breed on the islands, including Lesser Frigatebird (*Fregata ariel*), Bridled Tern (*Onychoprion anaethetus*), Roseate Tern (*Sterna dougallii*) and Common Noddy (*Anous stolidus*). Approximately 2,500 pairs of Lesser Frigatebirds nest on West Lacepede Island (DEWHA 2008).



Figure 2: Annual cycle of migratory shorebirds on the northern WA coast



Source: Adapted from <http://www.fba.org.au/publication/downloads/FBA-FS-Coastal-Migratory-Birds-FINAL.pdf>

1.4 Study Objectives

The specific objectives identified in the SA scoping document (DSD 2009), which are relevant to migratory birds, are to:

- Quantify the use of the James Price Point and surrounding areas by migratory shorebirds and seabirds particularly those protected by JAMBA / CAMBA / ROKAMBA Agreements or protected under other Commonwealth or State Legislation; and
- Compare the faunal habitats and fauna of the proposed precinct location with those in the surrounding James Price Point coastal area.

The key objective of this Migratory Bird Study is to determine whether the James Price Point coastal area includes any sites that are particularly important as habitat for migratory bird species in a regional context, particularly for species of conservation significance. In order to achieve this objective, this Study is designed to:

1. Provide an understanding of the distribution and abundance of migratory bird species within the James Price Point coastal area.
2. Determine the potential habitat usage of the site for migratory bird species, particularly those protected under international agreements and conventions (i.e. CAMBA, JAMBA, ROKAMBA, CMS/Bonn Convention), the EPBC Act, and the *WA Wildlife Conservation Act 1950*.
3. Undertake an assessment of the relative importance of the James Price Point coastal area as a habitat for migratory bird species compared to other sites on the Dampier Peninsula (e.g. Perpendicular Head-North Head, and Packer Island) that represent important foraging habitat for these species.
4. Understand the likely role of habitats within the James Price Point coastal area in relation to migratory bird movement patterns and habitat usage along the Dampier Peninsula coastline.



2. METHODOLOGY

2.1 Approach

The Migratory Bird Study is a desktop study only. It is not anticipated that further field surveys of shorebirds in the James Price Point coastal area will be required, as shorebirds in the Study Area were surveyed during the Supplementary Terrestrial Fauna and Habitat Assessment (DSD 2010) (see **Section 3.1.5**), and also given the fact that shorebird numbers at three locations within the Study Area (James Price Point, Coulomb Point and Quondong Point) will be counted on an annual basis as part of the northwest Australian component of the Monitoring Yellow Sea Migrants in Australia (MYSMA) and Shorebirds 2020 project (Rogers *et al.* 2009)—see **Section 3.1.2**. Additional counts of other bird species in the Study Area may well be conducted as part of planned future terrestrial fauna surveys, and monitoring programs.

The diversity and abundance of migratory bird species at sites on the Dampier Peninsula during the winter months are likely to be considerably less than during the spring, summer and autumn months. The majority of migratory wading birds using the key foraging and roosting sites at Roebuck Bay and Eighty Mile Beach undertake their migrations during the Northern Hemisphere winter (October to March), and consequently the peak periods for both the southward migration (September-October) and the northward migration (March-April) largely overlap the wet season in the Kimberley (**Figure 2**).

A wet season avifauna survey of the James Price Point coastal area was undertaken in March 2009 (Biota 2009a). Whilst a dry season avifauna census was not undertaken for the Coulomb Point to Quondong Point area as part of the Vertebrate Fauna Assessment survey of four locations on the Dampier Peninsula (ENV Australia 2008a), a comprehensive list of bird species expected to occur at that location was compiled by a respected local ornithologist—George Swann (Appendix H in ENV Australia 2008a). A late dry season avifauna survey was conducted in November 2009, as part of the Supplementary Terrestrial Fauna and Habitat Assessment (DSD 2010).

2.2 Methods

The Migratory Bird Study is comprised of four key elements: 1) literature review; 2) database searches; 3) habitat analysis; and 4) regional assessment.

2.2.1 Definition of ‘Migratory’

The Bonn Convention defines a migratory species as:

“the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries”.

Many bird species are essentially sedentary, the members of the population moving little throughout their lives. In some species, first-year birds may wander far from their natal area, but once they have established a breeding territory, they may show little inclination to move beyond its limits. Such species are termed ‘residents’ (Johnstone and Storr 1998). In marked contrast to resident species, other species depart from their breeding territories as soon as the young are fledged. Those species where the total population leaves the breeding area and moves regularly to fixed, non-breeding quarters, on a seasonal basis, are termed ‘migrants’. Confusingly, within the migrants there are a number of sub-categories, including breeding and non-breeding summer visitors, passage migrants, residents, vagrants etc. (Johnstone, in McKenzie 1983).

Johnstone (in McKenzie 1983) describes six main groups of migrant birds for the Dampier Peninsula avifauna:

1. Non-breeding summer visitors from the Northern Hemisphere, e.g. Grey Plover, Fork-tailed Swift.
2. Breeding summer visitors from the north, e.g. Bridled Tern.
3. Non-breeding visitors from the south.
4. Passage migrants, e.g. many of the waders such as Sharp-tailed Sandpiper.
5. Resident species whose numbers are greatly augmented by visitors in winter, e.g. Brown Goshawk, Rainbow Bee-eater.
6. Vagrants and rare visitors from elsewhere in Australia.



For the purposes of this Study, migratory birds are defined as species that are listed as ‘migratory’ under the EPBC Act, species that are included on Appendices I and II of the Bonn Convention, species that are listed on the CAMBA, JAMBA and ROKAMBA bilateral migratory bird agreements, and species listed on Schedule 3 of the WA *Wildlife Conservation (Specially Protected Fauna) Notice 2010*. If a species is not listed as migratory under any of these instruments then it will not have been included in this Study.

2.2.2 Study Area

The Study Area for this Migratory Bird Study was confined to an area of the coastal hinterland, coastal strip and inshore waters that stretches from approximately 5 km south of Quondong Point to 5 km north of Coulomb Point, incorporating the James Price Point site location, as identified in the NDT Site Evaluation Report (NDT 2008)—see **Figure 3**. This polygon includes the area of inshore coastal waters out to a distance of approximately 15 km from the shore.

For the purposes of this report, the terms “Study Area” and “James Price Point coastal area” should be regarded as synonymous.

2.2.3 Literature Review

This element consists of a review and synthesis of existing information of migratory bird distribution and abundance within the Study Area, and more broadly on the western side of the Dampier Peninsula, from relevant desktop studies and field survey reports. Particular references that include key information on migratory birds on the Dampier Peninsula are:

- DSD 2010. *Supplementary Terrestrial Fauna and Habitat Assessment. James Price Point, WA.*
- Biota 2009a. *James Price Point Terrestrial Fauna Survey: Wet Season 2009.*
- Rogers *et al.* 2009. *Monitoring Yellow Sea Migrants in Australia (MYSMA): North-western Australian shorebird surveys and workshops, December 2008.*
- ENV Australia 2008a. *Perpendicular Head-North Head, Packer Island, Gourdon Bay and Coulomb-Quondong. Vertebrate Fauna Assessment.*
- ENV Australia 2008b. *Biological Assessment of Dampier Peninsula, West of Cape Leveque Road.*
- *ecologia* Environment 2004. *Beagle Bay Big Tree Country Tropical Timber Plantation Survey Fauna Assessment Survey.*
- Johnstone, in McKenzie (ed.) 1983. *Wildlife of the Dampier Peninsula, South-west Kimberley, Western Australia.*

2.2.4 Database Searches

This element comprises a synthesis of previous database searches on avifauna of the Dampier Peninsula, including the James Price Point coastal area, plus new searches for the Study Area that are defined by a smaller, more targeted search zone. This includes data on migratory bird presence/absence from database searches detailed in the unpublished reports listed above. Additionally, search lists from the following databases and spatial search tools were examined for records of migratory species in the Study Area:

- EPBC Act Protected Matters database;
- Birds Australia (BA) Birddata Atlas and database (largely based on the BA Atlas of Australian Birds); and
- WA Museum (WAM) and WA Department of Environment and Conservation (DEC) NatureMap biodiversity mapping tool.

The EPBC Act Protected Matters search was based on the NDT polygon, with the application of a 10 km buffer zone around it (see **Figure 4**). The Birddata and NatureMap searches were based on rectangles that stretch from a southern boundary approximately 5 km south of Quondong Point to a northern boundary 5 km north of Coulomb Point, incorporating the NDT polygon (see **Figure 5** and **Figure 6**). All three search areas exclude Barred Creek (located approximately 10 km south-southeast of Quondong Point), but include the area of inshore coastal waters out to a distance of approximately 15 km from the shore (**Figure 4**, **Figure 5** and **Figure 6**).

This element of the Study includes an assessment of the conservation status/significance of all migratory species included on these search lists, as covered by the following legislation, international conventions and agreements:



- The EPBC Act.
- The Convention on the Conservation of Migratory Species of Wild Animals, 1983 (commonly known as the Convention on Migratory Species [CMS] or the Bonn Convention).
- Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment (commonly referred to as the China Australia Migratory Bird Agreement or CAMBA).
- Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (commonly referred to as the Japan Australia Migratory Bird Agreement or JAMBA).
- Agreement between the Government of Australia and the Government of the Republic of Korea on the Protection of Migratory Birds (commonly referred to as the Republic Of Korea Australia Migratory Bird Agreement or ROKAMBA).
- WA *Wildlife Conservation (Specially Protected Fauna) Notice 2010*—Schedule 3 – Migratory birds protected under an international agreement.

An assessment was also made of the status of all migratory species under the DEC Priority Fauna list, and the World Conservation Union (IUCN) Red List of Threatened Species.

2.2.5 Habitat Analysis

This element of the Study was comprised of an analysis of the probable utilization of different habitat types in the Study Area by migratory bird species. There are eight primary habitat types identified for the James Price Point coastal area—including the seven terrestrial habitat types identified by Biota (Biota 2009a; 2009b), plus the littoral (intertidal) habitat from Spring High Tide Level (SHTL) to Spring Low Tide Level (SLTL):

- a) pindan shrubland;
- b) coastal communities;
- c) coastal heath;
- d) open forest;
- e) monsoon vine thicket;
- f) tall closed scrub;
- g) drainage basin; and
- h) littoral zone.

Figure 7 provides a map of the vegetation types in the Study Area, derived from the ENV Australia Dry Season 2008 Vegetation Survey (ENV Australia 2008c) and the Biota Wet Season 2009 Vegetation Survey (Biota 2009b).

The littoral zone includes intertidal mudflats, tidal mud and reef flats, stony, sandy and algal covered beaches that would be particularly important foraging habitats for migratory wading bird species.

The habitat analysis comprised a qualitative assessment of the probable utilization of each of these habitats by migratory birds (particularly those species of particular conservation significance), and included an examination of any seasonal or other temporal patterns of habitat utilization (e.g. diurnal, tidal) that may exist. It also involved a review of information on migratory birds from a broader range of published material on avifauna, including:

- Published and grey literature material on migratory wader populations at Roebuck Bay and Eighty Mile Beach (e.g. Wade and Hickey 2008; de Goeij *et al.* 2008; Piersma *et al.* 2006; Rogers *et al.* 2003).
- Barrett *et al.* 2003. *The New Atlas of Australian Birds*.
- Geering *et al.* 2007. *Shorebirds of Australia*.
- Johnstone and Storr 1998. *Handbook of Western Australian Birds. Volume 1 – Nonpasserines (Emu to Dollarbird)*.
- Marchant and Higgins 1990. *Handbook of Australian, New Zealand and Antarctic Birds. Volume 1: Ratites to Ducks: Part B Australian Pelican to Ducks*.
- Marchant and Higgins 1993. *Handbook of Australian, New Zealand and Antarctic Birds Volume 2: Raptors to Lapwings*.
- Pizzey and Knight 1997. *Field Guide to the Birds of Australia*.



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Figure 4: EPBC Protected Matters search area

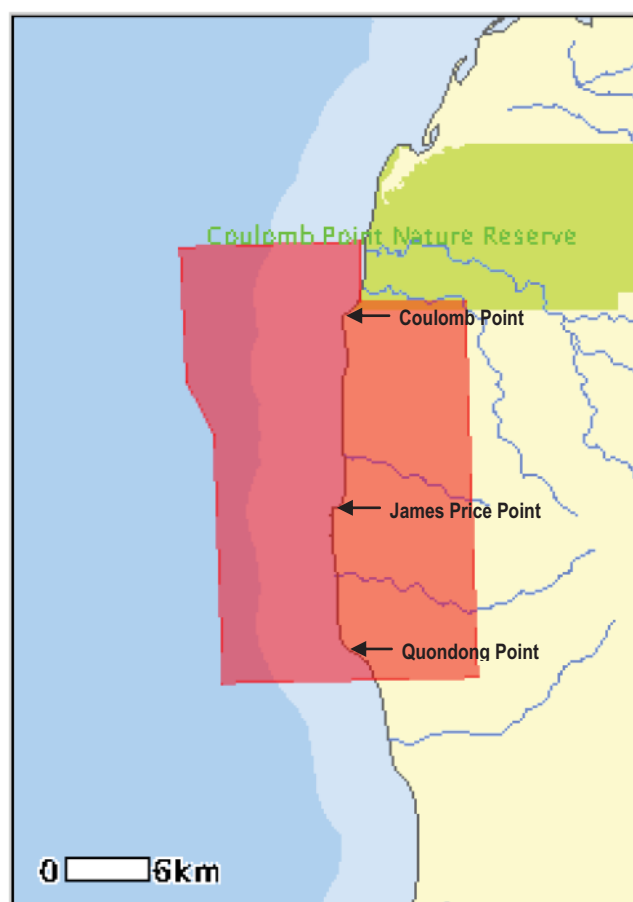


Figure 5: Birdata Atlas search area

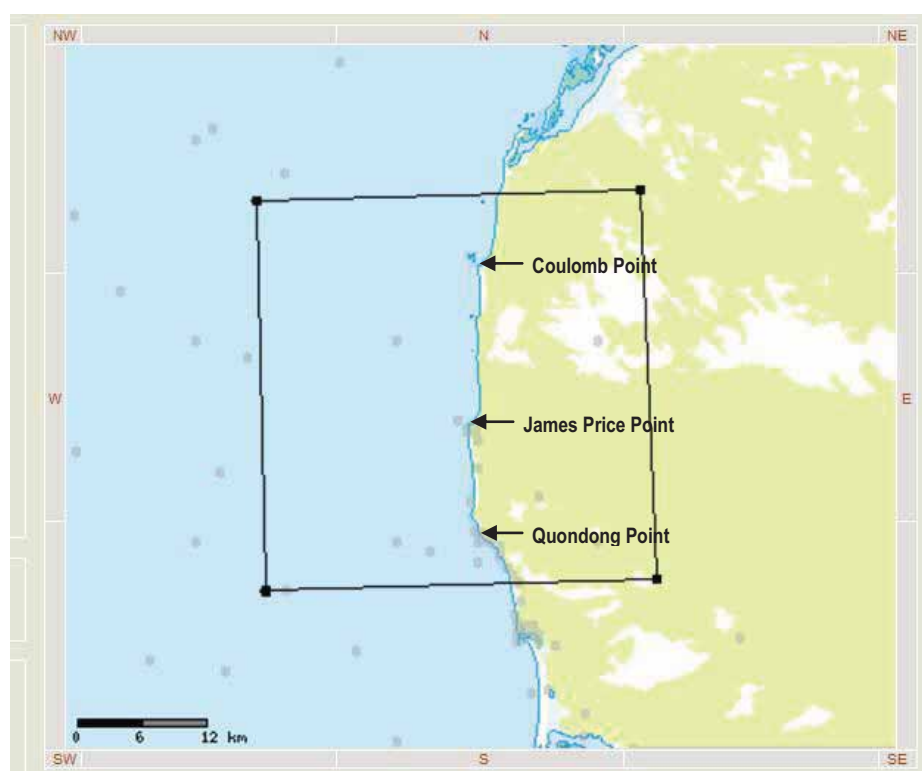
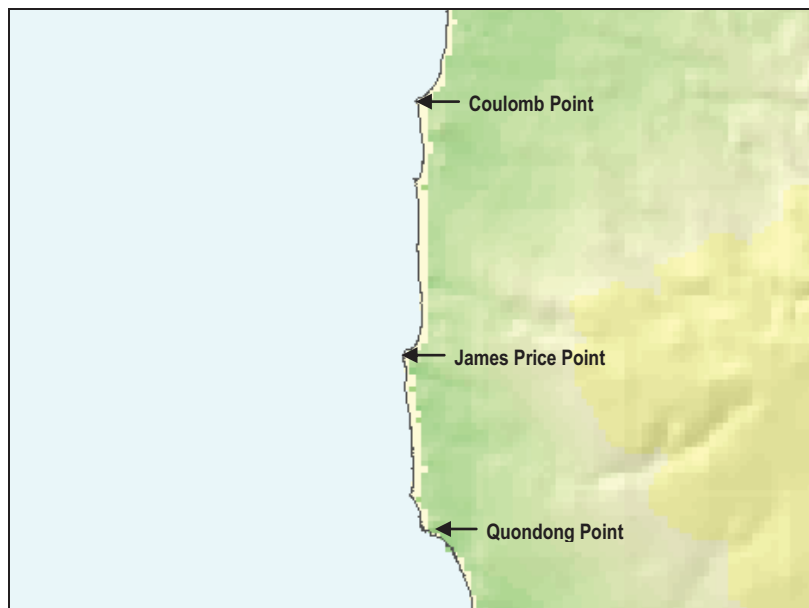


Figure 6: NatureMap database search area



2.2.6 Regional Assessment

This final element of the Study comprised of a qualitative assessment of the relative importance of the James Price Point coastal area as a habitat for migratory bird species compared to other sites on, and adjacent to, the Dampier Peninsula (e.g. Eighty Mile Beach, Roebuck Bay, Perpendicular Head-North Head; Packer Island; Lacepede Islands). This element was based on the results and outcomes of Elements 1-3 of the Study, as described above. In addition, the importance of the James Price Point coastal area in relation to migratory bird movement patterns was also considered.



3. RESULTS

3.1 Migratory Bird Species Recorded in the Study Area

A total of 39 migratory bird species have been recorded within the Study Area (**Table 1**). This list has been compiled from the literature review and database searches, and includes information on: their migratory status (regular migrant, visitor, resident etc.); their conservation listing under the EPBC Act, the Bonn Convention, CAMBA, JAMBA, ROKAMBA, and the WA Wildlife Conservation Act; preferred habitats; and data sources. Where available, the table includes numbers of individual birds counted in a particular survey (**Table 1**).

From a taxonomic perspective, all of the families represented in **Table 1** are within non-passerine bird orders—i.e. they are non-perching species that do not fall within the Order Passeriformes, which includes all of the passerine species (perching birds, or less accurately, songbirds).

Five data sources were used to compile the list in **Table 1**:

- A. Late dry season census November 2009 (DSD 2010).
- B. Wet season census March 2009 (Biota 2009a).
- C. Summer 2009 census, combined MYSMA and Shorebirds 2020 project (Rogers *et al.* 2009).
- D. Birddata Atlas custom list (Birds Australia 2009a).
- E. NatureMap bird search (WAM/DEC 2009).

3.1.1 Late Dry Season Census November 2010

The AECOM-Strategen team was commissioned by DSD to undertake a supplementary dry season fauna and faunal habitat assessment (fauna assessment) in November 2009, to complement previous wet and dry season surveys (DSD 2010). The survey was undertaken from 9th to 13th November 2009 (DSD 2010), and included aerial fauna habitat mapping, and one high tide and one low tide aerial survey for coastal birds. This census recorded 21 species of listed migratory birds within the Study Area (**Table 1**). During the high tide and low tide surveys a total of 40 bird species was recorded that are listed as marine or migratory bird species under the EPBC Act. A total of 561 individual coastal birds were observed during the high tide aerial survey and 1,277 individual coastal birds were sighted during the low tide survey. Large congregations of terns (especially Common Terns) were recorded south of the project area on sandy spits associated with the mouths of Barred and Willie Creeks (DSD 2010).

3.1.2 Wet Season Census March 2009

The wet season avifauna survey of the James Price Point coastal area, undertaken from 10th to 28th of March 2009 (Biota 2009a), only included seven primary habitat types identified in **Section 2.2.5**. Significantly, this census does not appear to have included the intertidal zone and consequently only one individual of a single species of migratory shorebird (the Common Sandpiper—*Actitis hypoleucos*) was recorded (**Table 1**). Additionally, this census was conducted in mid to late March, when many of the migratory shorebird species would have already left on their northward migration to the Northern Hemisphere (**Figure 2**). Hence, this wet season avifauna census cannot be seen as being representative of the full suite of migratory bird species in the area, particularly with regards to shorebirds and seabirds. This survey only recorded five species of migratory bird, with a total of 90 individuals (**Table 1**). The three most common migratory species recorded were the Rainbow Bee-eater (59), the Lesser Frigatebird (15), and the White-bellied Sea Eagle (8).

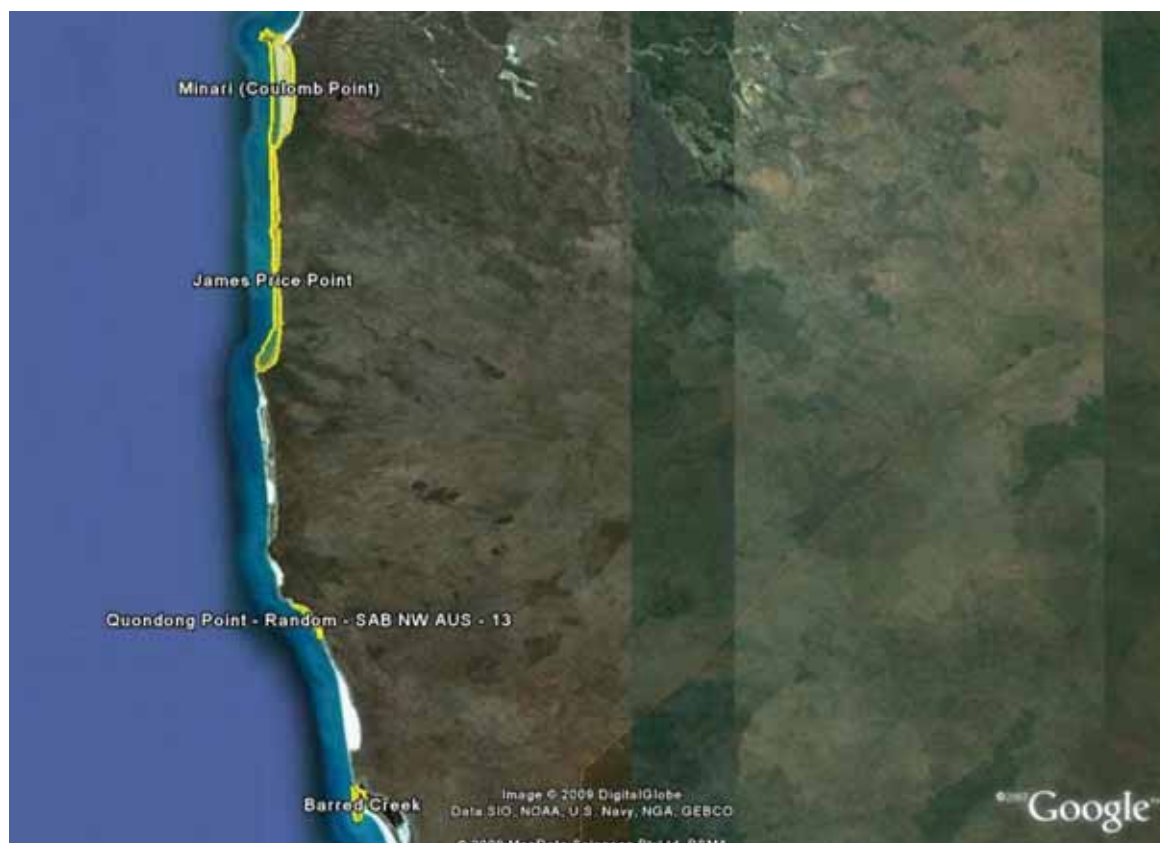
3.1.3 Summer 2009 Census, MYSMA/Shorebirds 2020 Project

A more representative sample of migratory shorebird species occurring in the Study Area is available from a census undertaken of sites on the west coast of the Dampier Peninsula in December 2008, as part of a combined Monitoring Yellow Sea Migrants in Australia (MYSMA) and Shorebirds 2020 project (Rogers *et al.* 2009). This survey took place on 13th to 14th December 2008 at four sites on the coastline – Coulomb Point, James Price Point, Quondong Point and Barred Creek (**Figure 8**). **Appendix A** includes the full data set from the waterbird counts at the four sites, including Google Earth images of the specific polygons for each area. Note that the MYSMA/Shorebirds 2020 data in **Table 1** excludes counts from Barred Creek, which is located outside the Study Area. As can be seen from **Table 1** and **Appendix A**, 18 species of migratory waterbird were recorded in the Study Area,



with a total of 644 individuals. The five most common species recorded at Coulomb Point, James Price Point and Quondong Point were the Common Tern (150), the Greater Sand Plover (93), the Lesser Crested Tern (79), the Red-necked Stint (74), and the Little Tern (63) (**Table 1**).

Figure 8: MYSMA/Shorebird 2020 waterbird survey sites on the west coast of the Dampier Peninsula



Source: http://www.shorebirds.org.au/pdfs/wa/Dampier_Peninsula.pdf

3.1.4 Birddata Atlas Custom List

A search of the Birds Australia Birddata Atlas (Birds Australia 2009a) for the defined polygon shown in **Figure 5** provided a custom list of 104 bird species for the Study Area, of which 34 are migratory species (**Table 1**). The full Birddata custom list and distribution maps for each migratory species recorded within the Study Area are provided in **Appendix B**. For the 34 migratory species recorded within the Study Area there were a total of 163 individuals, and the five most common species were the Brown Booby (23), the Eastern Reef Egret (20), the Rainbow Bee-eater (18), the White-bellied Sea Eagle (14), and the Grey-tailed Tattler (11) (**Table 1**).

3.1.5 NatureMap Bird Search

A search of the WAM/DEC NatureMap database (WAM/DEC 2009) for the area shown in **Figure 6** provided a list of just two migratory bird species for the Study Area—the Roseate Tern and the Fork-tailed Swift (**Table 1**). The full NatureMap report and location maps for these two species are provided in **Appendix C**. The Roseate Tern was recorded in the Study Area during the December 2008 MYSMA/Shorebirds 2020 survey (**Appendix A**), and both this species and the Fork-tailed Swift are included on the Birddata custom list for the Study Area (**Table 1**; **Appendix B**). Additionally, the Fork-tailed Swift was recorded in the Study Area during the late dry season bird census in November 2009 (DSD 2010) (see **Section 3.1.1**).



3.1.6 Most Common Migratory Bird Species in the Study Area

Overall, for the three data sources where individual counts are provided, the ten most common migratory bird species recorded within the Study Area are:

1. Common Tern (154);
2. Greater Sand Plover (101);
3. Lesser Crested Tern (82);
4. Red-necked Stint (77);
5. Rainbow Bee-eater (77);
6. Little Tern (64);
7. Grey-tailed Tattler (61);
8. Red Knot (28);
9. Sanderling (24); and
10. Lesser Frigatebird (24)

Together, these 10 species account for 77% of the total number of individuals (897) for the 39 species of migratory birds recorded within the Study Area (**Table 1**).



Table 1: Migratory bird species recorded in the Study Area

#	Family Common Name	Scientific Name	Migratory Status	EPBC	CMS	CAMBA	JAMBA	ROKAMBA	WCA	Habitat	A	B	C	D	E
Hydrobatidae (storm petrels)															
1	Wilson's Storm-petrel	<i>Oceanites oceanicus</i>	Visitor (winter)	Mi Ma			✓		✓	Winter visitor to tropical seas.				✓(1)	
2	Leach's Storm-petrel	<i>Oceanodroma leucorhoa</i>	Visitor (winter)	Mi Ma		✓	✓		✓	Migrates to tropical waters. Few Australian records.				✓(1)	
Sulidae (gannets and boobies)															
3	Brown Booby	<i>Sula leucogaster</i>	Resident (offshore islands)	Mi Ma		✓	✓	✓	✓	Blue-water seas, especially vicinity of breeding and roosting islands; occasionally mouths of mangrove creeks.				✓ (23)	
Ardeidae (egrets)															
4	Eastern Reef Egret	<i>Egretta sacra</i>	Resident	Mi Ma		✓			✓	Tidal reef and mud flats, mangrove creeks and rocky shores.				✓ (20)	
5	Great Egret White Egret	<i>Egretta alba</i> <i>Ardea modesta</i>	Resident	Mi Ma		✓	✓		✓	Mainly shallow freshwaters, but also shallow saltwaters (mangrove creeks, tidal pools, samphire swamps).				✓(1)	
Fregatidae (frigatebirds)															
6	Lesser Frigatebird	<i>Fregata ariel</i>	Resident (offshore islands)	Mi Ma		✓	✓	✓	✓	Tropical and sub-tropical seas, coasts and islands.	✓	✓ (15)		✓(9)	
Accipitridae (kites, hawks and eagles)															
7	White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	Resident	Mi Ma		✓			✓	Coasts, islands, estuaries, inlets, large rivers and inland lakes.	✓	✓(8)		✓ (14)	
8	Osprey Eastern Osprey	<i>Pandion haliaetus</i> <i>P. cristatus</i>	Resident	Mi Ma	A2S					Coasts, bays, estuaries, inlets, islands and surrounding waters.	✓	✓(7)		✓(7)	
Scolopacidae (sea curlews, godwits, sandpipers, snipes, knots, etc.)															
9	Common Sandpiper	<i>Actitis hypoleucos</i> <i>Tringa hypoleucos</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	Edge of sheltered waters salt or fresh, e.g. estuaries, mangrove creeks, rocky coasts, near-coastal salt lakes, river pools, lagoons, claypans, drying swamps.		✓(1)	✓(4)	✓(7)	



#	Family Common Name	Scientific Name	Migratory Status	Conservation Listing						Habitat	Source				
				EPBC	CMS	CAMBA	JAMBA	ROKAMBA	WCA		A	B	C	D	E
10	Ruddy Turnstone	<i>Arenaria interpres</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	Tidal mud and reef flats, sheltered rocky coasts, stony and seaweedy beaches and sandspits and pebbly shores of near-coastal saltlakes.	✓		✓ (15)	✓(6)	
11	Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	Tidal mudflats, saltmarshes, mangroves, shallow fresh, brackish or saline inland wetlands, floodwaters.	✓			✓(5)	
12	Sanderling	<i>Calidris alba</i> <i>Croceethica alba</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	Mainly steeply shelving sandy beaches exposed to ocean swell. Also sandy inlets, estuarine sandbanks and near-coastal saltlakes.	✓		✓ (21)	✓(3)	
13	Red Knot Knot	<i>Calidris canutus</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	Mud and sand flats in estuaries and on sheltered coasts, also near-coastal saltlakes.			✓ (27)	✓(1)	
14	Curlew Sandpiper	<i>Calidris ferruginea</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	Mainly beaches and shallows of estuaries and near-coastal saltlakes, and drying near-coastal freshwater lakes and swamps.				✓(1)	
15	Red-necked Stint	<i>Calidris ruficollis</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	Edge of sheltered salt, brackish or fresh waters: mainly estuaries, beaches, near-coastal saltlakes, and freshwater swamps and lakes (especially when drying).	✓		✓ (74)	✓(3)	
16	Great Knot	<i>Calidris tenuirostris</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	Mud or sand flats in estuaries and on sheltered coasts. Also near-coastal saltlakes.				✓(1)	
17	Grey-tailed Tattler	<i>Heteroscelus brevipes</i> <i>Tringa brevipes</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	Mainly tidal mud and reef flats. Also estuarine sand flats, beaches and near-coastal fresh and brackish waters.	✓		✓ (50)	✓ (11)	
18	Asian Dowitcher	<i>Limnodromus semipalmatus</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	Mudflats in tidal creeks.				✓ (1)	



#	Family Common Name	Scientific Name	Migratory Status	Conservation Listing						Habitat	Source						
				EPBC	CMS	CAMBA	JAMBA	ROKAMBA	WCA		A	B	C	D	E		
19	Bar-tailed Godwit	<i>Limosa lapponica</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	✓	Estuarine sand and mudflats and sandy and seaweedy beaches; also reef flats and near-coastal saltlakes.	✓				✓(1)	
20	Black-tailed Godwit	<i>Limosa limosa</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	✓	Shallows of freshwater lakes, swamps and river pools. Also (but mainly in passage) estuarine flats, rocky and muddy coasts and near-coastal saltlakes.					✓(1)	
21	Eastern Curlew	<i>Numenius madagascariensis</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	✓	Mainly tidal mudflats; also reef flats, sandy beaches and rarely near-coastal lakes.	✓				✓(1)	
22	Whimbrel	<i>Numenius phaeopus</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	✓	Mainly tidal mud and reef flats. Occasionally sandy beaches. Also near-coastal saltlakes.	✓			✓ (12)	✓(2)	
23	Wood Sandpiper	<i>Tringa glareola</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	✓	Mainly shallow fresh waters (lagoons, swamps, claypans, river pools, dams. Occasionally brackish swamps, rarely saltlakes and estuaries.	✓					
24	Common Greenshank Greenshank	<i>Tringa nebularia</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	✓	Shallow fresh waters (claypans, lagoons, swamps, river pools, dams) and salt waters (estuaries, mangrove creeks, lakes, samphire flats, reef flats).	✓			✓(1)		
25	Terek Sandpiper	<i>Xenus cinereus</i> <i>Tringa cinerea</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	✓	Mainly tidal flats. Also saltwork ponds.					✓(1)	
Charadriidae (plovers, lapwings and dotterels)																	
26	Greater Sand Plover Large Sand Plover	<i>Charadrius leschenaultii</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	✓	Mainly sandy beaches and tidal mud, reef and sand flats. Also shores of near-coastal saltlakes.	✓			✓ (93)	✓(8)	
27	Lesser Sand Plover Mongolian Plover	<i>Charadrius mongolus</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	✓	Mainly sandy beaches and tidal estuarine flats. Also near-coastal saltlakes.	✓			✓(1)	✓(2)	



#	Family Common Name	Scientific Name	Migratory Status	Conservation Listing					Habitat	Source					
				EPBC	CMS	CAMBA	JAMBA	ROKAMBA		WCA	A	B	C	D	E
28	Pacific Golden Plover	<i>Pluvialis fulva</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	Mainly salt or brackish marshes about estuaries and near-coastal saltlakes. Also near-coastal grassy flats, tidal mudflats, and beaches.			✓ (16)	✓(2)	
29	Grey Plover	<i>Pluvialis squatarola</i>	Regular migrant	Mi Ma	A2H	✓	✓	✓	✓	Mainly sandy and seaweedy ocean beaches. Also tidal reef and mud flats, shores of near-coastal saltlakes, and occasionally drying freshwater lakes.			✓(6)	✓(1)	
Laridae (gulls, terns, and skimmers)															
30	Common Noddy	<i>Anous stolidus</i>	Resident (offshore islands)	Mi Ma		✓	✓		✓	Blue-water seas remote from mainland, especially about breeding and roosting islands (including Scott Reef and Adele Island).				✓(1)	
31	White-winged Black Tern White-winged Tern	<i>Chlidonias leucoptera</i> <i>C. leucopterus</i>	Irregular visitor (non-breeding)	Mi Ma		✓	✓	✓	✓	Mainly estuaries and sheltered seas in north; also samphire and short-grass flats, saltlakes.			✓(7)		
32	Caspian Tern	<i>Hydroprogne caspia</i> <i>Sterna caspia</i> <i>H. tschegrava</i>	Visitor (breeding)	Mi Ma		✓	✓		✓	Mainly sheltered seas, estuaries (north of Adele Island), where mainly a winter visitor.				✓(3)	
33	Little Tern	<i>Sterna albifrons</i> <i>Sternula albifrons</i>	Visitor (non-breeding)	Mi Ma	A2S	✓	✓	✓	✓	Mainly sheltered seas, estuaries and mangrove creeks. Also near-coastal freshwater lagoons and saltwork ponds.	✓		✓ (63)	✓(1)	
34	Lesser Crested Tern	<i>Sterna bengalensis</i> , <i>Thalasseus bengalensis</i>	Resident	Mi Ma		✓				Mainly blue-water seas around island; also inshore seas protected by reefs and commonly visiting tidal creeks but not penetrating far into larger estuaries like King Sound.	✓		✓ (79)	✓(3)	
35	Roseate Tern	<i>Sterna dougallii</i>	Resident	Mi Ma		✓				Blue-water seas close to land (especially islands).			✓ (20)	✓(1)	✓



#	Family Common Name	Scientific Name	Migratory Status	Conservation Listing						Habitat		Source			
				EPBC	CMS	CAMBA	JAMBA	ROKAMBA	WCA	A	B	C	D	E	
36	Common Tern	<i>Sterna hirundo</i>	Regular migrant	Mi Ma		✓	✓	✓	✓	Sheltered seas, including estuaries; also near-coastal saltworks.	✓		✓ (150)	✓(4)	
Cuculidae (cuckoos)															
37	Oriental Cuckoo Himalayan Cuckoo	<i>Cuculus saturatus</i>	Visitor (non-breeding)	Mi Ma		✓	✓	✓	✓	Dense vegetation: riverside forests, rainforest patches, deciduous vine scrubs and forests and mangroves.	✓				
Apodidae (swifts)															
38	Fork-tailed Swift	<i>Apus pacificus</i>	Regular migrant	Mi Ma		✓	✓	✓	✓	Aerial, over open country, from semi-deserts to coasts, islands.	✓			✓(3)	✓
Meropidae (bee-eaters)															
39	Rainbow Bee-eater	<i>Merops ornatus</i>	Resident, breeding visitor, passage migrant and winter visitor	Mi Ma		✓			✓	Lightly wooded, preferably sandy country near water.	✓	✓ (59)		✓ (18)	

Notes:

1. Migratory status: derived Johnstone and Storr 1998; Pizzey and Knight 1997.
2. EPBC listing: Mi – Migratory; Ma – Marine.
3. CMS listing: A2S: species listed explicitly in Appendix II of the Bonn Convention; A2H: species is member of a family listed in Appendix II.
4. CAMBA, JAMBA, ROKAMBA: see main text for full description.
5. WCA: Migratory bird species listed on Schedule 3 of the WA *Wildlife Conservation (Specially Protected Fauna) Notice 2010*.
6. Preferred habitat: derived from Johnstone and Storr 1998; Pizzey and Knight 1997.
7. Data sources (figures in brackets show number of individuals):
 - A. Late dry season census November 2009 (DSD 2010)
 - B. Wet season census March 2009 (Biota 2009a)
 - C. Summer 2009 census, MYSMA/Shorebirds 2020 project (Rogers *et al.* 2009)
 - D. BirdAtlas custom list (Birds Australia 2009a)
 - E. NatureMap bird search (WAM/DEC 2009)



3.2 Migratory Bird Species Potentially Occurring in the Study Area

In addition to the 39 migratory bird species that definitely occur within the Study Area (**Table 1**), there are a large number of migratory bird species that could potentially occur within the James Price Point coastal area. **Table 2** lists an additional 28 species of migratory bird that could occur within the Study Area and surrounding marine and terrestrial environments.

This list is based on information gathered from four sources:

- A. EPBC Protected Matters Report (DEWHA 2009; **Appendix D**);
- B. Birddata Atlas list (Birds Australia 2009b; **Appendix E**);
- C. Johnstone (in McKenzie 1983); and
- D. Beagle Bay Big Tree Country Tropical Timber Plantation Survey Fauna Assessment Survey (*ecologia* Environment 2004).

3.2.1 EPBC Protected Matters Report

The EPBC Protected Matters Report (DEWHA 2009) for the James Price Point coastal area (**Appendix D**) includes 12 listed migratory bird species that may occur within the Study Area. Of these, five species have definitely been recorded within the Study Area—the White-bellied Sea Eagle, the Rainbow Bee-Eater, the Eastern Great Egret, the Fork-tailed Swift, and the Little Tern (**Table 1**). The further seven species from the Protected Matters Report are included in **Table 2**—the Gouldian Finch, the Barn Swallow, the Cattle Egret, the Oriental Plover, the Oriental Pratincole, the Painted Snipe, and the Streaked Shearwater.

3.2.2 Birddata Atlas List

The Birddata Atlas list (Birds Australia 2009b; **Appendix E**) is based on a search for a one degree square containing the point 17° 26' 54.06" S; 122° 9' 0.25" E (located on the shoreline between James Price Point and Quondong Point). It is comprised of 278 bird species, of which 65 are migratory species. The 39 migratory species that have been recorded within the Study Area (**Table 1**) are all included on this Birddata Atlas list. The additional 26 migratory species are included on **Table 2**—the two extra species included on this table but not on the Birddata Atlas list are the Gouldian Finch and the White Wagtail.

3.2.3 Johnstone (in McKenzie 1983)

Johnstone (in McKenzie 1983) lists 214 bird species for the Dampier Peninsula. Of these, 43 are migratory species, with 34 of these recorded within the Study Area (**Table 1**). The further nine species recorded in Johnstone's review are included in **Table 2**.

3.2.4 *ecologia* Environment (2004)

The *ecologia* Environment report on the fauna assessment survey for the Beagle Bay Big Tree Country Tropical Timber Plantation (*ecologia* Environment 2004) includes a list of 65 bird species observed in the project area (located approximately 12 km southeast of the Beagle Bay Community on the Dampier Peninsula), plus a further 110 bird species that could potentially occur in the area. Two of the 65 species recorded in the project area are migratory, with both of these (Fork-tailed Swift and Rainbow Bee-eater) recorded within the Study Area (**Table 1**). Of the list of 110 species potentially occurring in the project area, four species are migratory, of which one (Oriental Cuckoo) has been recorded in the Study Area (included on **Table 1**), whilst the remaining three species (Yellow Wagtail, Gouldian Finch and Barn Swallow) are included on **Table 2**.



Table 2: Migratory bird species potentially occurring in the Study Area

#	Family Common Name	Scientific Name	EPBC	CMS	Conservation Listing				Reference			
Anatidae (ducks, geese and swans)												
1	Garganey Garganey Teal	<i>Anas querquedula</i>	Mi Ma	A2H	✓	✓	✓	✓	✓	✓		
Procellariidae (petrels, prions and shearwaters)												
2	Short-tailed Shearwater	<i>Puffinus tenuirostris</i> <i>Ardenna tenuirostris</i>	Mi Ma		✓	✓	✓	✓	✓	✓		
3	Streaked Shearwater	<i>Calonectris leucomelas</i> <i>Puffinus leucomelas</i>	Mi Ma		✓	✓	✓	✓	✓	✓ BC		
4	Wedge-tailed Shearwater	<i>Puffinus pacificus</i>	Mi Ma			✓		✓	✓	✓		
Ardeidae (egrets)												
5	Cattle Egret	<i>Ardeola ibis</i> <i>Bubulcus ibis</i>	Mi Ma		✓	✓		✓	✓	✓		
Threskiornithidae (ibises and spoonbills)												
6	Glossy Ibis	<i>Plegadis falcinellus</i>	Mi Ma	A2S	✓			✓		✓		✓
Scolopacidae (sea curlews, godwits, sandpipers, snipes, knots, etc.)												
7	Pectoral Sandpiper	<i>Calidris melanotos</i>	Mi Ma	A2H		✓		✓		✓		
8	Long-toed Stint	<i>Calidris subminuta</i>	Mi Ma	A2H		✓		✓		✓		
9	Swinhoe's Snipe	<i>Gallinago megala</i> <i>Capella megala</i>	Mi Ma	A2H	✓	✓		✓		✓		
10	Pin-tailed Snipe	<i>Gallinago stenura</i> <i>Capella stenura</i>	Mi Ma	A2H	✓	✓		✓		✓		
11	Broad-billed Sandpiper	<i>Limicola falcinellus</i>	Mi Ma	A2H	✓	✓		✓		✓		✓
12	Little Curlew Little Whimbrel	<i>Numenius minutus</i>	Mi Ma	A2H	✓	✓		✓		✓		✓
13	Red-necked Phalarope	<i>Phalaropus lobatus</i>	Mi Ma	A2H	✓	✓		✓		✓		



#	Family Common Name	Scientific Name	EPBC	CMS	CAMBA	JAMBA	ROKAMBA	WCA	A	B	C	D
14	Ruff Reeve	<i>Philomachus pugnax</i>	Mi Ma	A2H	✓	✓	✓	✓		✓		
15	Marsh Sandpiper Little Greenshank	<i>Tringa stagnatilis</i>	Mi Ma	A2H	✓	✓	✓	✓		✓		
16	Common Redshank Redshank	<i>Tringa totanus</i>	Mi Ma	A2H	✓		✓	✓		✓		
Rostratulidae (painted snipe)												
17	Painted Snipe Australian Painted Snipe	<i>Rostratula benghalensis</i> s. lat. <i>R. australis</i>	V Mi Ma		✓			✓	✓	✓		
Charadriidae (plovers, lapwings and dotterels)												
18	Little Ringed Plover	<i>Charadrius dubius</i>	Mi Ma		✓		✓	✓		✓		
19	Oriental Plover Oriental Dotterel	<i>Charadrius veredus</i>	Mi Ma	A2H		✓	✓	✓	✓	✓ BC	✓	
Glareolidae (pratincoles and coursers)												
20	Oriental Pratincole	<i>Glareola maldivarum</i> <i>G. pratincola</i>	Mi Ma		✓	✓	✓	✓	✓	✓	✓	
Laridae (gulls, terns, and skimmers)												
21	Arctic Jaeger Arctic Skua	<i>Stercorarius parasiticus</i>	Mi Ma			✓	✓	✓		✓		
22	Bridled Tern	<i>Sterna anaethetus</i> <i>Onychoprion anaethetus</i>	Mi Ma		✓	✓		✓		✓	✓	✓
Apodidae (swifts)												
23	White-throated Needletail	<i>Hirundapus caudacutus</i> <i>Chaetura caudacuta</i>	Mi Ma		✓	✓	✓	✓		✓		
Hirundinidae (swallows)												
24	Red-rumped Swallow	<i>Hirundo daurica</i> <i>Cecropis daurica</i>	Mi Ma				✓	✓		✓		
25	Barn Swallow	<i>Hirundo rustica</i>	Mi Ma		✓	✓	✓	✓	✓	✓		✓



#	Family Common Name	Scientific Name	EPBC	CMS	CAMBA	JAMBA	ROKAMBA	WCA	A	B	C	D
Passeridae (finches and allies)												
26	Gouldian Finch	<i>Erythrura gouldiae</i>	EN Mi			✓			✓		✓	✓
Motacillidae (pipits and true wagtails)												
27	White Wagtail	<i>Motacilla alba</i>	MI Ma		✓			✓			✓	
28	Yellow Wagtail	<i>Motacilla flava</i> s. lat.	MI Ma		✓	✓	✓	✓		✓	✓	✓

Notes:

1. EPBC listing: MI – Migratory; Ma – Marine.
2. CMS listing: A2S: species listed explicitly in Appendix II of the Bonn Convention; A2H: species is member of a family listed in Appendix II.
3. CAMBA, JAMBA, ROKAMBA: see main text for full description.
4. WCA: Migratory bird species listed on Schedule 3 of the WA *Wildlife Conservation (Specially Protected Fauna) Notice 2010*.
5. References:
 - A. EPBC Act Protected Matters Search (DEWHA 2009)
 - B. Birddata Atlas list (Birds Australia 2009b)—records marked BC are from Barred Creek, just south of the Study Area
 - C. Johnstone (in McKenzie 1983)
 - D. *ecologia* Environment (2004)



3.3 Species of Particular Conservation Significance

3.3.1 EPBC Act

Of the 39 species of migratory bird recorded within the Study Area (**Table 1**), all are listed as both Migratory and Marine birds under the EPBC Act.

None of the species included in **Table 1** are listed Threatened species under the EPBC Act. Of the migratory bird species that could potentially occur in the Study Area (**Table 2**), two species are listed Threatened species under the EPBC Act—the Painted Snipe (Vulnerable), and the Gouldian Finch (Endangered). A brief description these species, in relation to their habitat preferences and likely occurrence in the Study Area, is provided below.

3.3.1.1 Painted Snipe

The Painted Snipe is a stocky wading bird with a long pinkish bill. This species is generally seen singly or in pairs, or less often in small flocks (Marchant and Higgins 1993). It has been recorded at wetlands in all states of Australia, but is most common in eastern Australia. The total population size of the Painted Snipe is effectively unknown, but tentative estimates range from a few hundred individuals to 5,000 breeding adults (Garnett and Crowley 2000). This species generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. According to Marchant and Higgins (1993), this species is found mainly in shallow, often temporary freshwater wetlands or saltmarshes, generally with good cover of grasses, low scrub, lignum, open timber or samphire. The most northerly breeding records include seven nests from near Derby prior to 1999 and one probable record from Taylor's Lagoon (around 60 km east of Broome) in 1999 (Hassell and Rogers 2002).

Given the existence of several small ephemeral freshwater swamps within the Study Area (see **Section 3.4**), the occurrence of this species within the James Price Point coastal area, whilst unlikely, cannot be definitively ruled out. It was not recorded during either the wet season avifauna survey of the James Price Point coastal area undertaken in March 2009 (Biota 2009a), or during the late dry season bird census conducted in November 2009 (DSD 2010). However, as pointed out in Biota (2009a):

“This species was recorded from the Dampier Peninsula during the most recent Birds Australia Bird Atlas Project (Barrett et al. 2003) and by the DEC in the vicinity of the project area in 1993, 1999 and 2002 (Appendix 1).”

3.3.1.2 Gouldian Finch

The Gouldian Finch is a small, vividly multi-coloured finch that is sparsely distributed across northern Australia from the Kimberley to north-central Queensland (Barrett *et al.* 2003). This species is currently known to occur in significant numbers (>50 adult birds) at only 10 locations (O'Malley 2006), and the total population size is estimated at 2,500 or less adult birds (Garnett and Crowley 2000). In the Kimberley, between 100 and 200 adult birds are estimated to exist at Mornington Wildlife Sanctuary and around Gibb River Road, with three additional local populations existing around Kalumburu Road, Wyndham and Kununurra (estimated to support 50 to 100 adult birds each) (O'Malley 2006).

The critical components of suitable core habitat for the Gouldian Finch appear to be the presence of favoured annual and perennial grasses (especially *Sorghum* spp.), a nearby source of surface water and, in the breeding season, unburnt hollow-bearing *Eucalyptus* trees (especially *E. tintinnans*, *E. brevifolia* and *E. leucophloia*) (Higgins *et al.* 2006; O'Malley 2006). Within the Study Area, *Sorghum* spp. grasses are common, but the *Eucalyptus* trees are dominated by *E. miniata*, *E. jensenii*, and *E. tectifica* (Biota 2009b). Given the propensity of this species to feed on, and occupy, grassy habitats, altered fire regimes such as is the case on the Dampier Peninsula may have contributed to reduced numbers of Gouldian Finches in this region, as has occurred with other congeners (Franklin 1999; cited in *ecologia* Environment 2004). This is most likely due to the change in composition of grasses, from perennial to annual species (Start 2003; cited in *ecologia* Environment 2004).

Whilst the Painted Snipe could conceivably occur within the Study Area (see above), it is very unlikely that the Gouldian Finch occurs in this area. Historical records of this species on the Dampier Peninsula are restricted to extreme north of the Peninsula south to Lombadina (Johnstone, in McKenzie 1983). According to ENV Australia (2008a), Traditional Owners have observed the



Gouldian Finch at Packer Island. The Gouldian Finch is not included on the Birddata Atlas list for the Study Area (**Section 3.2.2**), nor was it recorded during the fauna assessment survey for the Beagle Bay Big Tree Country Tropical Timber Plantation in March 2004 (*ecologia* Environment 2004).

3.3.2 Bonn Convention

Twenty-three of the 39 migratory species occurring in the Study Area (**Table 1**) are listed migratory species under the Convention on Migratory Species (CMS) or the Bonn Convention. Migratory species that have an unfavourable conservation status or would benefit significantly from international co-operation organised by tailored agreements are listed in Appendix II of the CMS. Of the 23 species in **Table 1** listed under the CMS, two (the Osprey and the Little Tern) are specifically included in Appendix II. The remaining 21 species are included in Appendix II on the basis that the families that they belong to are generically listed under Appendix II of the CMS. Of the 28 migratory bird species potentially occurring in the Study Area (**Table 2**), one species (the Glossy Ibis) is specifically included in Appendix II, and a further 12 species are generically listed under Appendix II.

3.3.3 CAMBA, JAMBA and ROKAMBA

Of the 39 species of migratory bird recorded within the Study Area (**Table 1**), 28 are listed under all three of the CAMBA, JAMBA and ROKAMBA bilateral migratory bird agreements. A further nine species are listed under either one or two of the agreements, and two species (the Osprey and the Roseate Tern) are not listed under any of them. Of the 28 migratory bird species potentially occurring in the Study Area (**Table 2**), 14 species are listed under all three agreements, and 14 species are listed under either one or two of the agreements.

3.3.4 IUCN Red List of Threatened Species

Thirty-seven of the 39 species in **Table 1** are listed under the IUCN Red List of Threatened Species, under the Least Concern (LC) category. A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for the Critically Endangered (CE), Endangered (EN), Vulnerable (VU) or Near Threatened (NT) categories. Widespread and abundant taxa are included in the LC category. The two exceptions to this LC listing on the Red List are the Asian Dowitcher (*Limnodromus semipalmatus*) and the Black-tailed Godwit (*Limosa limosa*), which are both listed under the NT category. A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for the Critically Endangered, Endangered or Vulnerable categories now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

Of the migratory bird species that could occur within the Study Area (**Table 2**), 27 species are listed under the LC category on the IUCN Red List of Threatened Species. The one exception is the Gouldian Finch, which is listed under the EN category.

3.3.5 WA Wildlife Conservation Act

With the exception of the Osprey, all of the species of migratory bird that have been recorded in the Study Area (**Table 1**) are protected under the WA *Wildlife Conservation Act 1950*, as they are listed on Schedule 3 (Migratory birds protected under an international agreement) of the *Wildlife Conservation (Specially Protected Fauna) Notice 2010*.

Of the migratory bird species that could occur within the Study Area (**Table 2**), 27 species are listed under Schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2010*. The remaining species, the Gouldian Finch, is listed under Schedule 1 (Fauna that is rare or is likely to become extinct) of the Notice. The Painted Snipe is listed under Schedule 1 of the Notice (as *Rostratula benghalensis australis*), and also under Schedule 3 (as *Rostratula australis*).

3.3.6 DEC Priority Fauna List

Only one species of migratory bird that has been recorded within the Study Area (**Table 1**) is listed on the WA Department of Environment and Conservation (DEC) Priority Fauna List. The Eastern Curlew (*Numenius madagascariensis*) is included on the Priority Fauna List as a Priority Four species (*Taxa in need of monitoring*: taxa which are considered to have been adequately surveyed, or for which



sufficient knowledge is available, and which are considered not currently threatened or in need of special protection but could be if present circumstances change).

None of the migratory bird species that could occur in the Study Area (**Table 2**) are listed on the DEC Priority Fauna List.

3.4 Habitat Analysis

During the high tide and low tide coastal bird surveys conducted as part of the Supplementary Terrestrial Fauna and Habitat Assessment (DSD 2010), 40 bird species were recorded that are listed as marine or migratory bird species under the EPBC Act. A total of 561 individual birds were observed during the high tide aerial survey and 1,277 individual coastal birds were sighted during the low tide survey. In addition, during the high tide survey large congregations of terns (especially Common Terns) were recorded south of the Study Area on sandy spits associated with the mouths of Barred and Willie Creeks. A White-bellied Sea Eagle nest was also observed along the coast within the Study Area (DSD 2010). Figures showing the results of the high and low tide aerial surveys are presented in **Appendix F**.

The March 2009 wet season avifauna survey of the James Price Point coastal area (Biota 2009a) recorded only five species of migratory bird, with a total of 90 individuals. As previously pointed out in **Section 3.1.2**, this survey only covered seven primary habitat types (**Figure 7**) and appears to have excluded the intertidal zone, and is therefore not representative of migratory shorebirds and seabirds. For the five species of migratory bird recorded during this survey, **Table 3** shows an analysis of species occurrence and number of individuals recorded in each of the seven habitat types.

The majority of the 30 individuals recorded in the Pindan Bushland (**Figure 7**) were from a single species—the Rainbow Bee-eater (29 individuals) (**Table 3**). Hence, it would appear from this limited dataset that the Coastal Communities habitat type (**Figure 7**) was the most significant for the five species of migratory bird recorded, for the period (10th to 28th of March) and times of day when the survey was conducted.

The MYSMA/Shorebirds 2020 Project summer 2009 census, undertaken on the 13th to 14th December 2008 at the three locations within the Study Area (Coulomb Point, James Price Point, Quondong Point – see **Section 3.1.3** and **Figure 8**) recorded 18 species of migratory waterbird, with a total of 644 individuals (**Table 1**). Presumably, these censuses will have been confined to the polygons shown in **Appendix A**—i.e. they appear to include the Coastal Communities habitat type identified in Biota (Biota 2009a), plus the sandy beaches above SHTL, and the intertidal zone from the SHTL to SLTL.

The Study Area is characterised by narrow beaches with an intermittent rocky shoreline and platforms of lithified coastal sediments which adjoin stretches of low lying cliffs and sand dunes to the landward side (SKM 2008). The upper sandy intertidal zone and dune systems are likely to comprise of white, aeolian quartz and carbonate sands. This area appears to be well vegetated, however large ‘blow-out’ areas are evident. Schematic representations of the variety of main intertidal habitat types are presented below in **Figure 9**. Within this zone across the Study Area, sandy and rocky shores and platforms dominate the geomorphology type (SKM 2008). Much of the sand flats encompass the entire zone from mean SLTL to mean SHTL on what is assumed to be a low gradient, however in some areas they are interrupted by rock boulders and pavements both along and across the shore.

Across the shore, the sandy flat often gives way to broken rocky boulders which are more regularly inundated by marine water in the lower intertidal. Along the shore, regular cliff outcrop interruptions are present, in some cases forming rocky points which completely exclude the sand flat from the intertidal region. Profile A represents the characteristic sandy flats of this site which often give way to variable rock platforms in the lower intertidal, whereas profiles B and C demonstrate the variation in this dominant habitat type as a result of rocky outcrops and reef platforms (SKM 2008) (**Figure 9**).

Significantly, much of the coastline within the Study Area has a direct west-facing aspect and represents the most exposed shorelines along the western side of the Dampier Peninsula. The Study Area does not include any supratidal mudflats that would represent important foraging areas for migratory wading birds within the families Scolopacidae and Charadriidae (Biota 2009b; **Figure 7**). Nor does it include any mangals that would be important feeding and roosting habitat for a number of migratory bird species (e.g. Brown Booby, Eastern Reef Egret, Great Egret, Common Sandpiper, Sharp-tailed Sandpiper, Common Greenshank, Little Tern and Oriental Cuckoo—see **Table 1**).

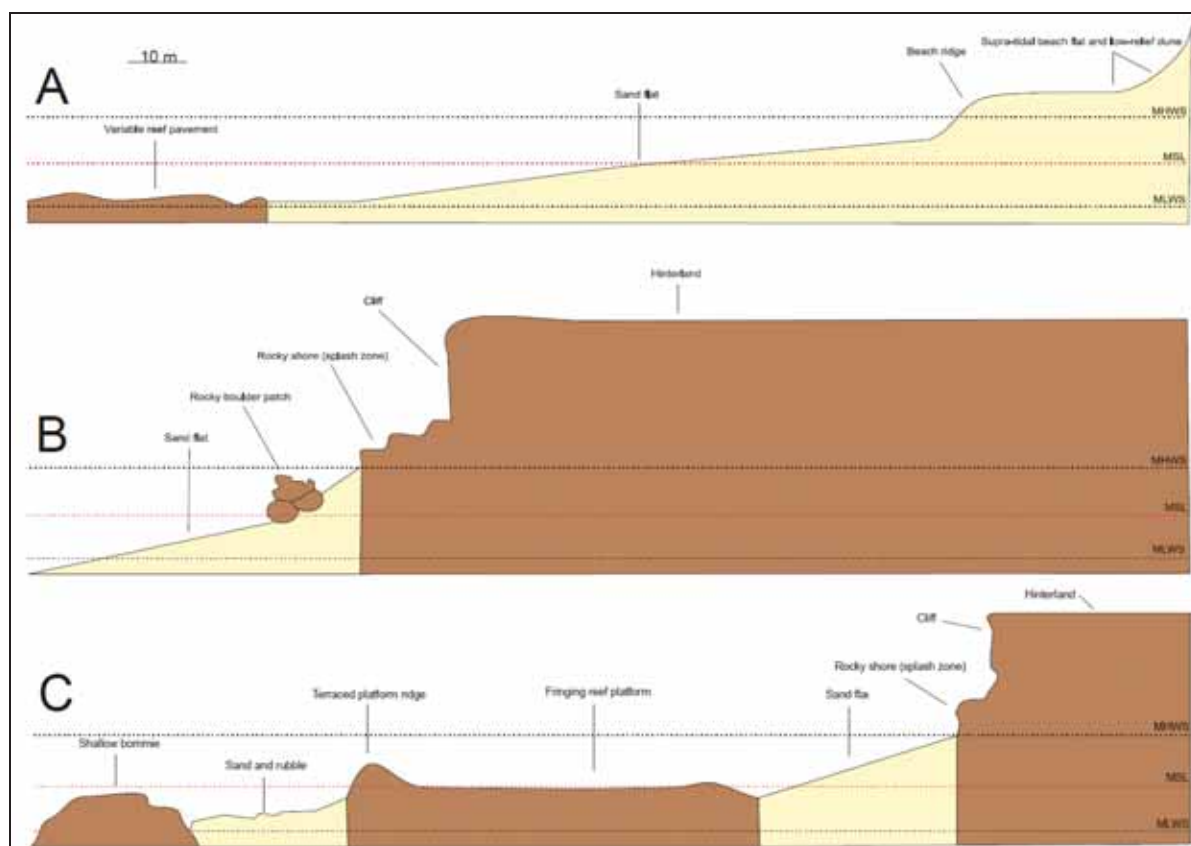


Table 3: Wet season avifauna census March 2009 – habitat analysis for migratory bird species

#	Family	Scientific Name	Pindan Bushland	Coastal Communities	Coastal Heath	Habitat Open Forest	Monsoon Vine Thicket	Tall Scrub	Drainage Basin	Total
Fregatidae										
1	Lesser Frigatebird	<i>Fregata ariel</i>	1	1	2		1	7	3	15
Scolopacidae										
2	Common Sandpiper	<i>Tringa hypoleucos</i>		1						1
Accipitridae										
3	Osprey	<i>Pandion haliaetus</i>		5	2					7
4	White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>		5	3					8
Meropidae										
5	Rainbow Bee-eater	<i>Merops ornatus</i>	29	5		15	4	2	4	59
Totals										
Total Number of Individuals:			30	17	7	15	4	9	7	90
Number of Species:			2	5	3	1	1	2	2	



Figure 9: Variation in the biophysical habitats present throughout the intertidal zone of the Study Area



Source: SKM (2008)

The Study Area does include intertidal habitats that represent foraging sites for a large number of migratory shorebird species—see **Table 1**). Additionally, the beaches, dunes, rocky outcrops and cliffs above mean SHTL would represent roosting habitat for a variety of migratory bird species during periods of high spring tides. However, similar intertidal habitats are well represented along the west coast of the Dampier Peninsula (see **Section 3.5**), along with roosting habitats in adjoining sandy beaches, dunes, rocky outcrops and cliffs. Therefore, the James Price Point coastal area does not include any intertidal or coastal strip habitats that are not well represented in the region, and hence is unlikely to host any regionally significant populations of migratory birds showing a preference for these habitats.

For the whole of the Dampier Peninsula, Johnstone (in McKenzie 1983) provides a breakdown of the avifauna under each of the main habitat types:

1. Pindan: 56 species (31 non-passerines).
2. Eucalypt forest and woodland: 30 species (15 non-passerines).
3. *Melaleuca* woodland, thickets and scrubs, vine forests, thickets and scrubs: 29 species (11 non-passerines).
4. *Tristania* swamps: 24 species (20 non-passerines).
5. Samphire flats, grasslands and coastal dunes: 21 species (14 non-passerines).
6. Creekside vegetation: 8 species (4 non-passerines).
7. Mangal: 20 species (6 non-passerines).
8. Inshore seas, tidal mudflats, beaches and coastal cliffs: 59 species (46 non-passerines).

This gives an indication of the species richness within each habitat type for the Dampier Peninsula, but more particularly it shows the importance of the inshore seas, intertidal habitats and adjacent coastal strip for the non-passerine species. As pointed out in **Section 3.1**, all of the migratory bird species recorded in the Study Area are within families that comprise the non-passerine bird orders. The breakdown provided above also points to the importance of the pindan bushland and *Tristania* swamps for non-passerine bird species.



Pindan covers about 70% of the Peninsula, and contains many flowering trees and shrubs and often a good ground cover of spinifex and soft grasses. It tends to contain a large number of nomads, breeding and non-breeding visitors. Pindan shrubland is well represented within the Study Area (**Figure 7**), as it is the vegetation unit with the largest areal extent (Biota 2009b).

The *Tristania* swamps referred to by Johnstone (in McKenzie 1983) are swamps that consist of circular claypans in drainage basins that are completely vegetated or fringed with Lardik (*Lophostemon grandiflorus*). The taxon name *Tristania grandiflora* is not current, and has been replaced with *Lophostemon grandiflorus*. These swamps account for less than 1% of the area of the Peninsula but are important for waterfowl and some waders (Johnstone, in McKenzie 1983).

Within the Study Area, these swamps occur in drainage basins that are areas subject to ephemeral freshwater flooding, ponding, or seepage and are found behind coastal sand dunes subject to seasonal inundation. The ponding is often the result of coastal dunes truncating drainage lines (Biota 2009b). They occur at several locations in the Study Area (Biota 2009b; **Figure 7**), including:

- Murtjal Creek—the basin is small and supports only a small population of Lardik and paperbarks; and
- Moorak Windmill—there is a much more extensive basin located between monsoon vine thicket and pindan shrubland. During and after the wet season this area is sometimes subject to flooding that can prevent road access to James Price Point.

The drainage basin habitat type at these two locations within the Study Area, as mapped during the Biota Wet Season 2009 Vegetation Survey (Biota 2009b; see **Figure 7**), covers an area of approximately 32 hectares (ha) (Ben Malseed, WEL Browse Business Unit, pers. comm., November 2009). The ENV Australia Dry Season 2008 Vegetation Survey (ENV Australia 2008c) also mapped a further 364 ha of ephemeral freshwater lakes/claypans to the south and east of Coulomb Point (**Figure 7**). Therefore, these ephemeral wetlands cover a total area of approximately 396 ha within the Study Area.

Whilst these ephemeral wetlands within the Study Area may provide habitat for some migratory bird species on a seasonal basis, they are not expected to host large or diverse bird assemblages, particularly as this habitat type is well represented at other locations on the Dampier Peninsula. For instance, the Perpendicular Head-North Head and Packer Island locations surveyed by ENV Australia (2008c; see habitat maps in **Appendix G**) included approximately 1,100 ha of the ephemeral wetland habitat type (Ben Malseed, WEL Browse Business Unit, pers. comm., November 2009). Additionally, areas just to the north of the Study Area (e.g. Coulomb Point Nature Reserve and Carnot Bay) also include large areas of ephemeral wetland habitat.

3.5 Regional Assessment

The avifauna of two other locations on the Dampier Peninsula has been surveyed as part of the baseline studies for the NDT's assessment of potential sites in the Kimberley for the development of a LNG hub for the processing of Browse Basin gas reserves. These sites are: Perpendicular Head-North Head; and Packer Island. Avifauna records for these two locations are detailed in the ENV Australia report (2008a). Habitat maps for these two locations are provided in **Appendix F**. These maps also show the avifauna census sites at these two locations (ENV Australia 2008a).

Tables 4 and **5** provide sightings records for the migratory bird species recorded at these two locations, arranged by habitat type. For the Perpendicular Head-North Head site, a total of 20 species of migratory bird were recorded (with a total of 690 individuals) during the vertebrate fauna field surveys, which were undertaken from 22nd to 31st May 2008 (ENV Australia 2008a). All of these 20 species were also recorded for the James Price Point coastal area (**Table 1**). Given the timing of this survey, many of the migratory waders that could be expected to occur in the area were not present, as they would have migrated back to the Northern Hemisphere to breed. Consequently, the migratory bird species list for the James Price Point coastal area includes a further nine species of regular migrant from the Scolopacidae and Charadriidae families: Common Sandpiper, Ruddy Turnstone, Sharp-tailed Sandpiper, Red Knot, Curlew Sandpiper, Asian Dowitcher, Black-tailed Godwit, Terek Sandpiper and Lesser Sand Plover.

As the data in **Table 4** shows, the most important (in terms of total number of individuals and species richness) habitat type for migratory birds at the Perpendicular Head-North Head site appears to be Dunes & Rocky Headlands, closely followed by the Pindan Woodland habitat type. However, as pointed out above, this probably reflects the period during which the census was taken (late May) when many regular migrants normally utilising the intertidal flats would have been absent.



Table 5 provides the migratory bird records for the census taken at Packer Island between 5th and 14th June 2008 (ENV Australia 2008a). A total of 15 migratory species were recorded, with a total of only 193 individuals. Again, all of these 15 species were also recorded from the James Price Point coastal area. The most important habitat type in this case would appear to be the Intertidal Flats, with 166 individuals of 12 species of migratory bird recorded (**Table 5**).

Tappers Inlet (at Perpendicular Head-North Head) is an important wader site, with extensive rich, sandy mudflats that support significant numbers of waders (see map in **Appendix G**). This site could support thousands of waders in summer (ENV Australia 2008a). It was not possible to access all areas of the site during the ENV Australia vertebrate fauna surveys, so as yet undiscovered intertidal mudflats similar to Tappers Inlet may exist, particularly at the Packer Island survey area (such as the mouth of Chile Creek and Tjilbata Creek, and between Packer Island and the mainland) (**Appendix G**).

Weedong Lagoon, which is an ephemeral freshwater lake located within the Perpendicular Head-North Head site (see map in **Appendix G**), may provide a significant habitat for a large number of migratory bird species. Migratory birds found in semi-permanent freshwater lakes include the Garganey, the Painted Snipe, the Gouldian Finch, and several species of egrets and ibis. This habitat type is also likely to provide habitat in summer for migratory shorebirds. Migratory raptors, such as the White-bellied Sea Eagle and the Osprey, forage around semi-permanent freshwater lakes (ENV Australia 2008a).



Table 4: Migratory bird species recorded in the Perpendicular Head-North Head area

Common Name	Scientific Name	Habitat					Total
		Dunes & Rocky Headlands	Pindan Woodland	Drainage Lines	Mangroves	Freshwater/ Ephemeral Lakes	Intertidal Flats
Brown Booby	<i>Sula leucogaster</i>	22	1				2
Lesser Frigatebird	<i>Fregata ariel</i>	1					1
Great Egret	<i>Ardea alba</i>						1
Eastern Reef Egret	<i>Egretta sacra sacra</i>	6	4				14
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>		2			5	10
Osprey	<i>Pandion haliaetus</i>	1	1				2
Sanderling	<i>Calidris alba</i>	15					15
Red-necked Stint	<i>Calidris ruficollis</i>	55	23				79
Great Knot	<i>Calidris tenuirostris</i>		6				6
Bar-tailed Godwit	<i>Limosa lapponica</i>	25	20				47
Eastern Curlew	<i>Numenius madagascariensis</i>	1					1
Whimbrel	<i>Numenius phaeopus</i>	1	8		20		32
Grey-tailed Tattler	<i>Tringa brevipes</i>	64	65				129
Common Greenshank	<i>Tringa nebularia</i>	1	25			4	26
Greater Sand Plover	<i>Charadrius leschenaultii</i>	47	31				78
Pacific Golden Plover	<i>Pluvialis fulva</i>						1
Grey Plover	<i>Pluvialis squatarola</i>	3	1				4
White-winged Black Tern	<i>Chlidonias leucopterus</i>					3	3
Lesser Crested Tern	<i>Sterna bengalensis</i>		6				10
Rainbow Bee-eater	<i>Merops ornatus</i>	29	37	7	4	51	128
Total Number of Individuals:		274	230	7	24	63	690
Number of Species:		15	14	1	2	4	12

Source: ENV Australia (2008a) [Appendix I]



Table 5: Migratory bird species recorded in the Packer Island area

Common Name	Scientific Name	Pindan Woodland	Supratidal Mudflats/ Samphire	Mixed Shrubland Thicket	Habitat Mangroves	Freshwater/ Ephemeral Lakes	Intertidal Flats	Opp *	Total
Eastern Reef Egret	<i>Egretta sacra sacra</i>						1		1
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	1							1
Osprey	<i>Pandion haliaetus</i>	1							1
Common Sandpiper	<i>Actitis hypoleucos</i>						30	1	31
Ruddy Turnstone	<i>Arenaria interpres</i>						17		17
Red-necked Stint	<i>Calidris ruficollis</i>						20		20
Bar-tailed Godwit	<i>Limosa lapponica</i>						10		10
Whimbrel	<i>Numenius phaeopus</i>		8		2		10		20
Grey-tailed Tattler	<i>Tringa brevipes</i>						20		20
Common Greenshank	<i>Tringa nebularia</i>						20		20
Greater Sand Plover	<i>Charadrius leschenaultii</i>						30		30
Grey Plover	<i>Pluvialis squatarola</i>						4		4
Little Tern	<i>Sternula albifrons</i>						1		1
Lesser Crested Tern	<i>Sterna bengalensis</i>						3		3
Rainbow Bee-eater	<i>Merops ornatus</i>	3	3	3	1	4			14
Total Number of Individuals:		5	11	3	3	4	166	1	193
Number of Species:		3	2	1	2	1	12	1	

Source: ENV Australia (2008a) [Appendix I]

Notes: * Opp = Opportunistic

The data presented in **Tables 1, 4 and 5** should not be regarded as representative of the actual species richness and abundance of migratory birds at each of these three sites on the Dampier Peninsula. Of the three locations, the James Price Point coastal area is not necessarily the site with the most significant populations of migratory bird species. It is impossible to directly compare the three locations, and there are a number of reasons for this:

1. As detailed above, the surveys at the Perpendicular Head-North Head and Packer Island sites were undertaken during the Southern Hemisphere autumn and winter, when many regular migrants would have left the region to fly to breeding areas in the Northern Hemisphere.
2. None of the data presented takes into account the time of day and tidal conditions when the counts were taken.
3. The data for Perpendicular Head-North Head and Packer Island do not include records from Birds Australia Birddata Atlas and WAM/DEC NatureMap database searches for the locations.
4. There are no recent summer shorebird counts (i.e. December 2008) for Perpendicular Head-North Head or Packer Island, as these sites are not included in the MYSMA/Shorebirds 2020 project census locations. The most comprehensive shorebird data available for the west coast of the Dampier Peninsula is for the James Price Point coastal area, including Quondong Point to the south, and Coulomb Point to the north (Rogers *et al.* 2009).

As detailed in **Sections 3.1.4 and 3.1.5**, the list of migratory bird species for the Study Area includes records derived from Birds Australia Birddata Atlas and WAM/DEC NatureMap database searches. In order to provide an accurate comparison of the number of migratory bird species at each of the three locations, wet season survey data, Birddata Atlas data, and NatureMap data would have to be available for the both the Perpendicular Head-North Head and Packer Island locations.

Indeed, given the presence of potentially significant habitats for waders and other migratory waterbirds at both Perpendicular Head-North Head (Tappers Inlet, Weedong Lagoon), and Packer Island (the mouth of Chile Creek and Tjilbata Creek), further data collection and analysis may indicate that these sites are more important locations for migratory bird species than the James Price Point coastal area.

Regionally, the James Price Point coastal area has to be regarded as relatively insignificant as a summer feeding site for migratory shorebirds compared to Eighty Mile Beach and Roebuck Bay. These two locations are considered of international significance given the numbers of birds that feed in these areas seasonally, and they are also listed Ramsar sites (Wetlands of International Importance) (Watkins 1993). As an example, **Table 6** provides counts for the five most common, listed migratory, shorebird species in the Study Area as recorded in December 2008, compared to counts for the same species from Eighty Mile Beach from the same surveys (Rogers *et al.* 2009). The Eighty Mile Beach numbers are also shown as a percentage of the total Flyway population for that species—anything over 1% of the total Flyway population is categorised as internationally significant. Similarly, the intertidal mudflats at Roebuck Bay regularly support over 100,000 birds, which makes it one of the most important intertidal areas for shorebirds in the world (Piersma *et al.* 2006).

Table 6: Comparison of shorebird counts from the Study Area and Eighty Mile Beach

Species	Shorebird Numbers from MYSMA/Shorebirds 2020 counts in December 2008		
	Study Area	Eighty Mile Beach	% of East Asian-Australasian Flyway Population
Greater Sand Plover	93	22,698	21
Red-necked Stint	74	28,168	9
Grey-Tailed Tattler	50	7,945	16
Red Knot	27	23,123	10
Sanderling	21	3,427	15
Totals	265	85,361	

Similarly, the James Price Point coastal area does not include breeding colonies of any migratory seabirds and hence has to be regarded as insignificant at a regional level. Along the west coast of the Dampier Peninsula the Lacepede Islands are undoubtedly the most significant location for migratory



seabirds, with tens of thousands of nesting Brown Booby, Lesser Frigatebird, Bridled Tern, Roseate Tern and Common Noddy (DEWHA 2008).

4. DISCUSSION

Prior to this desktop study, information on migratory bird species presence/absence and abundance within the James Price Point coastal area was restricted to a list of bird species expected to occur at that location (compiled by a respected local ornithologist, George Swann—see Appendix H in ENV Australia 2008a), plus records from the wet season avifauna survey undertaken in March 2009 (Biota 2009a) and the late dry season bird census conducted in November 2009 (DSD 2010). As has been pointed out, the wet season avifauna survey did not include the intertidal zone and was conducted in mid to late March, when many of the migratory shorebird species would have already left on their northward migration to the Northern Hemisphere. Hence, this wet season census cannot be seen as being representative of the full suite of migratory bird species in the area, particularly with regards to shorebirds and seabirds.

The late dry season bird census conducted in November 2009 (DSD 2010) provides a list of bird species that has to be seen as more representative of the avifauna diversity in the James Price Point coastal area, particularly with respect to listed migratory shorebirds and seabirds. This is because, unlike the wet season avifauna survey, it incorporated high and low tide aerial surveys of intertidal habitats, and it was conducted after many migrants would have arrived on the northern WA coast. Consequently, an additional 17 species of listed migratory birds were recorded, predominantly wading birds in the Scolopacidae and Charadriidae families, but also a number of tern species (DSD 2010).

This Migratory Bird Study for the James Price Point coastal area utilises the 2009 wet season and late dry season avifauna data, plus an additional three sources of information (MYSMA/Shorebirds 2020 project summer 2009 census; Birddata Atlas custom list; and NatureMap bird search) to compile a comprehensive list of migratory bird species. This process has resulted in a list of 39 species of migratory bird that have been recorded in the Study Area. These species are included on the list on the basis of their listing as migratory species under the EPBC Act, the Bonn Convention, the three bilateral migratory bird agreements that are designed to protect and conserve migratory waterbirds utilising the East Asian-Australasian Flyway (CAMBA, JAMBA and ROKAMBA), and the WA Wildlife Conservation Act.

Further database searches and literature reviews have resulted in an additional list of 28 migratory bird species that could potentially occur in the Study Area, based on records for the broader Dampier Peninsula area.

An analysis of habitat preferences for migratory birds on the Dampier Peninsula indicates that inshore seas, intertidal sand, reef and mudflats, beaches and coastal cliffs probably represent the most important habitats for migratory bird species in the region, as determined by species richness and abundance. This is particularly the case for the Arctic-breeding shorebirds, as the western coastline of the Dampier Peninsula may represent the first landfall in Australia for many of these species as they complete their southern migration to the internationally significant feeding areas at Roebuck Bay and Eighty Mile Beach.

Rogers *et al.* (2009) point out that the area from Barred Creek to Coulomb Point, which includes the four census locations for the MYSMA/Shorebirds 2020 project on the west coast of the Dampier Peninsula, is a rather steep coastline by north-western Australian standards, with sandy beaches meeting low coastal cliffs or steep sand dunes (**Figure 9**). According to Rogers *et al.* (2009):

“Birdwatchers visit the area reasonably regularly, and have never found very large concentrations of shorebirds there. One of the drawcards attracting birdwatchers to this coastal stretch is the large flocks of terns which occur there at times, but numbers were reasonably low at the time of our surveys on 13th – 14th December; no species were found in internationally significant numbers.”

The MYSMA/Shorebirds 2020 shorebirds data from December 2008 (see **Appendix A**) provides some insight into the relative importance of each of the four census locations for shorebirds, at the point in time when the counts were made. The numbers of individuals and species recorded at each location are as follows:

- Coulomb Point – 634 individuals, 22 species;
- Quondong Point to 5 km south – 349 individuals, 18 species;
- Barred Creek – 307 individuals, 21 species; and
- James Price Point – 96 individuals, 16 species.



The numbers of individuals for both Coulomb Point and Quondong Point are skewed by large numbers of a single species—Crested Tern (not a listed migratory species) for Coulomb Point, and Common Tern (a listed migratory species) for Quondong Point. Species richness may provide a better indication of the relative importance of each of the four locations for shorebirds. Coulomb Point has much higher counts, and a higher number of species, than James Price Point for migratory waders in the Scolopacidae and Charadriidae families (**Appendix A**). This may reflect a habitat preference, with these birds preferring the wide sandy beach and intertidal areas just to the south of Coulomb Point, compared to the low eroded pindan cliffs between James Price Point and Flat Rock. However, it may also have been influenced by the time of day and tidal state when the counts were taken.

It is unlikely that the James Price Point coastal area (including Coulomb Point) includes any regionally significant habitat for migratory bird species, as the area does not include any intertidal or coastal strip habitat types that are not well represented in the region. Hence, the area is unlikely to host any regionally significant populations of migratory birds showing a preference for these habitats.

With respect to a number of habitat types that are important feeding and roosting areas for migratory birds (e.g. intertidal sand and mudflats, tidal creeks and mangals), it is probable that locations on the Dampier Peninsula both south and north of the Study Area include far more extensive areas of these habitats. For instance: Willie Creek and Barred Creek to the south, and Carnot Bay, Baldwin Creek, Camp Inlet, Beagle Bay, Tappers Inlet, Pender Bay, Chile Creek and Thomas Bay to the north. Of these, detailed data on migratory birds is only available for Barred Creek and Tappers Inlet, as the other sites were not surveyed as part of the NDT site evaluation process. The census at Barred Creek concentrated on shorebirds, and as has been previously mentioned, the survey data from Perpendicular Head-North Head and Packer Island cannot be seen as representative of the full suite of species likely to occur at these locations.

Pindan woodland probably represents the second-most important habitat for migratory bird species within the James Price Point coastal area, after inshore seas, intertidal sand and reef flats, rocky outcrops, beaches and coastal cliffs. However, pindan woodland and scrubland is the vegetation type that predominates across the whole of the Dampier Peninsula, covering some 70% of the area. Therefore, any migratory bird species exhibiting a preference for this type of habitat could be expected to be fairly widespread across the region.

The Study Area includes several small drainage basins that are subject to ephemeral freshwater flooding, ponding, or seepage, and are vegetated with Lardik and paperbarks. These ephemeral wetlands (e.g. at the western end of Murtjal Creek; near Moorak Windmill; and to the south and east of Coulomb Point—see **Figure 7**) may provide habitat for some migratory bird species on a seasonal basis. However, they are not expected to host large or diverse bird assemblages, particularly as the areal extent of these swamps is very small, and the habitat type is well represented at other locations on the Dampier Peninsula.

Regionally, the James Price Point coastal area has to be regarded as relatively insignificant as a summer feeding site for migratory shorebirds compared to the internationally significant sites at Eighty Mile Beach and Roebuck Bay, to the south of Broome. Similarly, unlike the Lacepede Islands that are a nationally important nesting location for a number of migratory seabirds, the Study Area does not include breeding habitat for any migratory seabirds and hence has to be regarded as unimportant at a regional level.

This Migratory Bird Study clearly addresses the specific objectives for migratory birds identified in the SA scoping document (DSD 2009), which were to:

- Quantify the use of the James Price Point and surrounding areas by migratory shorebirds and seabirds particularly those protected by JAMBA / CAMBA / ROKAMBA Agreements or protected under other Commonwealth or State Legislation; and
- Compare the faunal habitats and fauna of the proposed precinct location with those in the surrounding James Price Point coastal area.

Overall, the conclusion of this Migratory Bird Study is that the migratory bird population of the James Price Point coastal area comprises a suite of species that are widespread and well-represented on the Dampier Peninsula. Therefore, the migratory bird populations of this area can be considered to be of low conservation significance in a regional and international context.



5. REFERENCES

- Aumann T and D Baker-Gabb 1991. RAOU Report 75. *A Management Plan for the Red Goshawk*. RAOU. Royal Australasian Ornithologists Union, Melbourne.
- Bamford M, Watkins D, Bancroft W, Tischler G and J Wahl 2008. Migratory shorebirds of the East Asian-Australasian Flyway: Population estimates and internationally important sites. Wetlands International – Oceania, Kingston ACT. 240 pp.
<http://oceania.wetlands.org/LIBRARY/tabid/479/mod/1570/articleType/ArticleView/articleId/2012/Default.aspx>
- Barrett G, Silcocks A, Barry S, Cunningham R and R Poulter 2003. *The New Atlas of Australian Birds*. Birds Australia (Royal Australasian Ornithologists Union).
- Biota 2009a. *James Price Point Terrestrial Fauna Survey: Wet Season 2009*. Unpublished Draft Report, prepared for the WA Department of State Development by Biota Environmental Sciences, July 2009. 90 pp. <http://www.dsd.wa.gov.au/documents/000016AT01.John.GILL.pdf>
- Biota 2009b. *A Vegetation and Flora Survey of James Price Point: Wet Season 2009*. Unpublished Draft Report, prepared for the WA Department of State Development by Biota Environmental Sciences, July 2009. 122 pp. <http://www.dsd.wa.gov.au/documents/000017AT01.John.GILL.pdf>
- Birds Australia 2009a. Birddata Atlas custom list for the James Price Point coastal area. Birddata Atlas online mapping tool, accessed 28th September 2009. <http://www.birddata.com.au/custom.vm>
- Birds Australia 2009b. Birddata Atlas list for the western Dampier Peninsula. Birddata Atlas online mapping tool, accessed 28th September 2009. <http://www.birddata.com.au/maps.vm>
- de Goeij P, Lavaleye M, Pearson GB and T Piersma 2008. Seasonal changes in the macro-zoonbenthos of Roebuck Bay: a 10 year study. Report on MONROEB-2, MONitoring ROEBuck Bay Benthos, 1996-2005. Royal Netherlands Institute for Sea Research (NIOZ), Texel, The Netherlands. 57 pp. http://www.nioz.nl/public/nioz_reports/nioz_report_2008-9.pdf
- DEC 2009. *Protecting the Kimberley. A synthesis of scientific knowledge to support conservation management in the Kimberley region of Western Australia*. May 2009. Department of Environment and Conservation, WA. 48 pp. <http://www.dec.wa.gov.au/land/major-initiatives/kimberley-science-and-conservation-strategy.html>
- DEWHA 2008. The North-west Marine Bioregional Plan: Bioregional Profile. A Description of the Ecosystems, Conservation Values and Uses of the North-west Marine Region. Australian Government Department of the Environment, Water, Heritage and the Arts. Canberra. 288 pp. <http://www.environment.gov.au/coasts/mbp/publications/north-west/pubs/bioregional-profile.pdf>
- DEWHA 2009. *EPBC Act Protected Matters Report*. James Price Point coastal area. Commonwealth Department of Environment, Water, Heritage, and the Arts, online database. Accessed 28th September 2009. <http://www.environment.gov.au/erin/ert/epbc/index.html>
- DSD 2009. Kimberley LNG Precinct. *Scope of the Strategic Assessment*. Unpublished Draft Report prepared by the WA Department of State Development, August 2009. 239 pp. <http://www.dsd.wa.gov.au/documents/000014.John.GILL.pdf>
- DSD 2010. Supplementary Terrestrial Fauna and Habitat Assessment, James Price Point, WA. Report prepared for the WA Department of State Development by AECOM Australia Pty Ltd. March 2010. 144 pp.
[http://www.dsd.wa.gov.au/images/Supplementary Terrestrial Fauna and Habitat Assessment.pdf](http://www.dsd.wa.gov.au/images/Supplementary_Terrestrial_Fauna_and_Habitat_Assessment.pdf)
- ecologia Environment 2004. *Beagle Bay Big Tree Country Tropical Timber Plantation Survey Fauna Assessment Survey*. Unpublished Report, March 2004. 71 pp.
http://www.epa.wa.gov.au/docs/BeagleBay/ecologia_FaunaAssessment.pdf
- ENV Australia 2008a. *Perpendicular Head-North Head, Packer Island, Gourdon Bay and Coulomb-Quondong. Vertebrate Fauna Assessment*. Unpublished Report No. RP005 Final, prepared for the WA Department of Industry and Resources, September 2008. 153 pp.
- ENV Australia 2008b. *Biological Assessment of Dampier Peninsula, West of Cape Leveque Road*. Unpublished Report No. RP001, prepared for Sinclair Knight Merz (SKM). October 2008. 127 pp.



- ENV Australia 2008c. *Perpendicular Head-North Head, Packer Island, Gourdon Bay and Coulomb-Quondong Vegetation Assessment*. Unpublished Report No. RP003, prepared for the WA Department of Industry and Resources, October 2008. 53 pp.
http://www.dmp.wa.gov.au/documents/Appendix_8.2_ENV_Preliminary_Vegetation_Assessment_Report_V2.0.pdf
- Franklin DC 1999. Evidence of disarray amongst granivorous bird assemblages in the savannas of northern Australia, a region of sparse human settlement. *Biological Conservation*, **90**: 58-68.
- Garnett ST and GM Crowley 2000. *The Action Plan for Australian Birds 2000*. Environment Australia and Birds Australia. Canberra, ACT.
<http://www.environment.gov.au/biodiversity/threatened/publications/action/birds2000/index.html>
- Geering A, Agnew L and S Harding 2007. *Shorebirds of Australia*. CSIRO Publishing, Collingwood, VIC. 242 pp.
- Hassell CJ and DI Rogers 2002. Painted Snipe nesting at Taylor's Lagoon near Broome, North-Western Australia. *Stilt*, **41**: 14-21. <http://www.awsg.org.au/stilt/Stilt-41.pdf>
- Higgins PJ, Peter JM and SJ Cowling (eds.) 2006. Boatbill to Starlings. In: *Handbook of Australian, New Zealand and Antarctic Birds*. 7. Melbourne, Oxford University Press.
- Johnstone RE in McKenzie NL (ed.) 1983. *Wildlife of the Dampier Peninsula, South-west Kimberley, Western Australia*. Western Australian Wildlife Research Centre, Department of Fisheries and Wildlife, Perth, Western Australia. *Wildlife Research Bulletin No. 11*: 54-69.
- Johnstone RE and GM Storr 1998. *Handbook of Western Australian Birds. Volume 1 – Nonpasserines (Emu to Dollarbird)*. Western Australian Museum, Perth, WA. 436 pp.
- Marchant S and PJ Higgins 1990. *Handbook of Australian, New Zealand and Antarctic Birds. Volume 1: Ratites to Ducks: Part B Australian Pelican to Ducks*. Oxford University Press, Melbourne, VIC.
- Marchant S and PJ Higgins 1993. *Handbook of Australian, New Zealand and Antarctic Birds Volume 2: Raptors to Lapwings*. Oxford University Press, Melbourne, VIC
- NDT 2008. Northern Development Taskforce Site Evaluation Report, Part B. September 2008. WA Department of Industry and Resources, Perth. 66 pp.
[http://www.dmp.wa.gov.au/documents/Site_Evaluation_Report_Part_B_\(release_14_Oct_2008\).pdf](http://www.dmp.wa.gov.au/documents/Site_Evaluation_Report_Part_B_(release_14_Oct_2008).pdf)
- NPWS 2002. Approved Recovery Plan for the Red Goshawk (*Erythrorchis radiatus*). NSW National Parks & Wildlife Service, Hurstville.
- O'Malley C 2006. National Recovery Plan for the Gouldian Finch (*Erythrura gouldiae*). WWF-Australia, Sydney and Parks and Wildlife NT, Department of Natural Resources, Environment and the Arts, NT Government, Palmerston.
<http://www.environment.gov.au/biodiversity/threatened/publications/pubs/e-gouldiae.pdf>
- Piersma T, Pearson G, Hickey R, Dittmann S, Rogers D, Folmer E, Honkoop P, Drent, J, de Goeij P and L Marsh 2006. Roebuck Bay Invertebrate and Bird Mapping 2006. Research Report ROEBIM-06. June/July 2006. Royal Netherlands Institute for Sea Research (NIOZ), Texel, the Netherlands. 67 pp. http://cees.eldoc.ub.rug.nl/FILES/root/Animal_Ecology/Articles/2006/PiersmaT-Roebim06/PiersmaT-Roebuck-2006.pdf
- Pizzey G and F Knight 1997. *Field Guide to the Birds of Australia*. HarperCollins, Sydney. 576 pp.
- Rogers DI, Piersma T, Lavaleye M, Pearson GB and P de Goeij 2003. *Life along land's edge. Wildlife on the shores of Roebuck Bay, Broome*. Department of Conservation and Land Management, Kensington, WA. 162 pp.
- Rogers D, Hassell C, Oldland J, Clemmens R, Boyle A and K Rogers 2009. Monitoring Yellow Sea Migrants in Australia (MYSMA): North-western Australian shorebird surveys and workshops, December 2008. Unpublished Report, June 2009. 76 pp.
http://www.awsg.org.au/pdfs/Report_on_MYSMA_surveys.pdf
- SKM 2008. Browse LNG Development (HUB) Biological Studies - Marine Intertidal Desktop Study for Dampier Peninsula. Unpublished Report prepared for Woodside Energy Ltd by Sinclair Knight Merz (SKM), December 2008. Perth, WA. 85 pp.



- Start AN 2003. Fire management and healthy country in the Kimberley region, Western Australia. In *Proceedings of the 2nd Biannual Kimberley Fire Forum: held at Brumby Base, El Questro Wilderness Park, East Kimberley, Western Australia, 3-6 May 2001* (ed JL Kohen). Kimberley Specialists, Kununurra. pp. 115–120.
- Straw P (ed.) 2004. Status and Conservation of Shorebirds in the East Asian-Australasian Flyway; Proceedings of the Australasian Shorebirds Conference 13-15 December 2003, Canberra, Australia. Wetlands International Global Series 18, International Wader Studies 17. Sydney, Australia. 199 pp. <http://www.wetlands.org/LinkClick.aspx?fileticket=tBISw4nYvvM%3d&tabid=56>
- Wade S and R Hickey 2008. Mapping migratory wading bird feeding habitats using satellite imagery and field data, Eighty Mile Beach, Western Australia. *Journal of Coastal Research*, **24**(3): 759-770. <http://www.bioone.org/doi/full/10.2112/05-0453.1#i1551-5036-24-3-759-f17>
- WAM/DEC 2009. NatureMap bird species report for James Price Point Coastal Area. NatureMap online mapping tool, accessed 30th September 2008. <http://naturemap.dec.wa.gov.au/default.aspx>
- Watkins D 1993. *A National Plan for Shorebird Conservation in Australia*. Australasian Wader Studies Group, Royal Australasian Ornithologists Union and World Wide Fund for Nature. RAOU Report No. 90. <http://www.environment.gov.au/biodiversity/migratory/publications/pubs/natplanshore.pdf>
- WEL 2009. Kimberley LNG Precinct. *Terms of Reference for Baseline Studies*. DRIMS#4371629. Woodside Energy Ltd.



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APPENDICES



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Appendix A: MYSMA/Shorebird 2020 Waterbird Survey Data and Site Polygons



Table 18. Waterbirds counts on the west coast of Dampier Peninsula, 13th – 14th Dec. 2008.

Species	Barred Creek	James Price Point	Minari (Coulomb Point)	Quondong Pt to 5 km S	Grand Total
SHOREBIRDS					
Black-fronted Dotterel			2		2
Common Greenshank	4		1		5
Common Sandpiper	5			4	9
Curlew Sandpiper	1				1
Great Knot	1				1
Greater Sand Plover	86	21	56	16	179
Grey Plover	18		2	4	24
Grey-tailed Tattler	52	3	29	18	102
Lesser Sand Plover	1			1	2
Pacific Golden Plover	5	2		14	21
Pied Oystercatcher	1	1	5		7
Red Knot		1	26		27
Red-capped Plover	10	9		31	50
Red-necked Stint	9	3	60	11	83
Ruddy Turnstone	24	1	12	2	39
Sanderling	2	5	16		23
Sharp-tailed Sandpiper			5		5
Sooty Oystercatcher		4	27	2	33
Whimbrel	22	8	3	1	34
Total	241	58	244	104	647
GULLS AND TERNS					
Common Tern	6		4	146	156
Crested Tern	19	32	270	25	346
Gull-billed Tern <i>affinis</i>	1				1
Gull-billed Tern <i>macrotarsa</i>			1		1
Lesser Crested Tern	8	2	35	42	87
Little Tern	24		50	13	87
Roseate Tern			20		20
Silver Gull	8	3	4		15
White-winged Black Tern				7	7
Total	66	37	384	233	720
OTHER WATERBIRDS					
Australian Pelican			2		2
Eastern Reef Egret		1		11	12
Little Pied Cormorant				1	1
White-faced Heron			4		4
Total		1	6	12	19
Waterbird Total	307	96	634	349	1386



Barred Creek



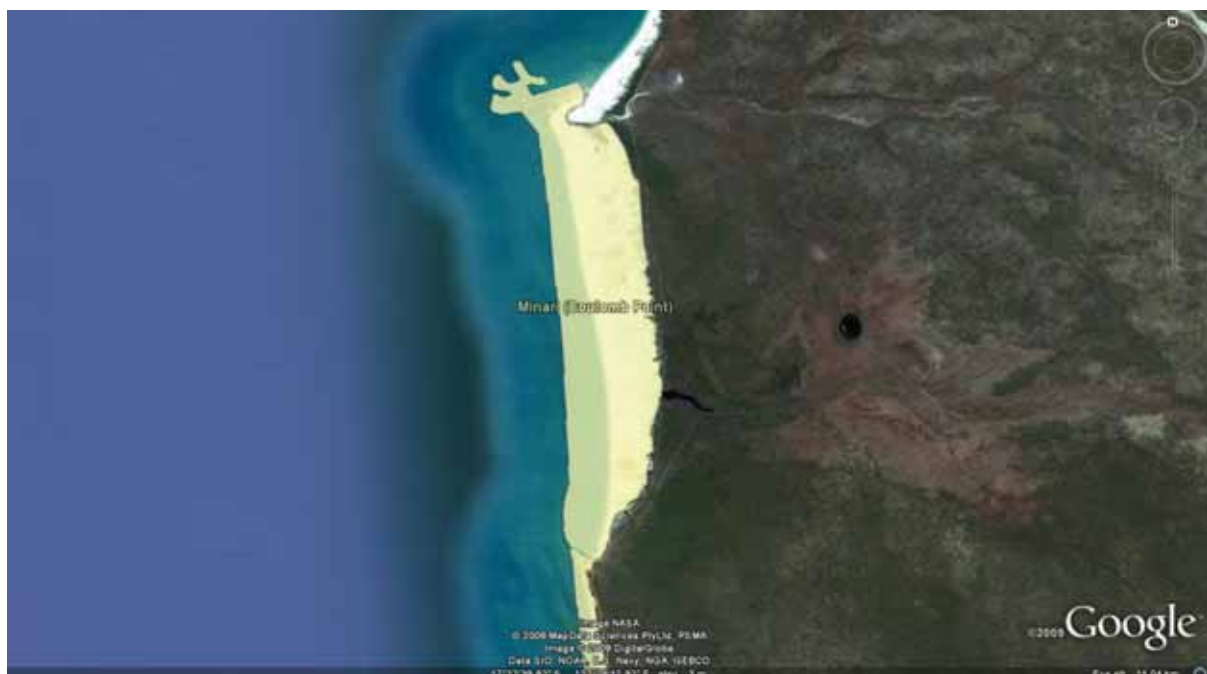
Quondong Point



James Price Point



Coulomb Point



Appendix B: Birdata Atlas Custom List and Species Distribution Maps for Migratory Bird Species in the Study Area



Birddata Custom Species List

Polygon coordinates:

(121.97425, -17.62528, NaN)

(121.96811, -17.3002, NaN)

(122.28706, -17.291, NaN)

(122.29933, -17.61455, NaN)

(121.97425, -17.62375, NaN)

(121.97425, -17.62528, NaN)

Month: All Months

Species count: 104

Common Name	Scientific Name	Survey Count
Brown Quail	Coturnix ypsilophora	4
Crested Pigeon	Ocyphaps lophotes	3
Peaceful Dove	Geopelia striata	5
Bar-shouldered Dove	Geopelia humeralis	16
Tawny Frogmouth	Podargus strigoides	1
Spotted Nightjar	Eurostopodus argus	1
Fork-tailed Swift	Apus pacificus	3
Leach's Storm-Petrel	Hydrobates leucorhoa	1
Wilson's Storm-Petrel	Oceanites oceanicus	1
Lesser Frigatebird	Fregata ariel	9
Brown Booby	Sula leucogaster	23
Little Pied Cormorant	Microcarbo melanoleucos	2
Little Black Cormorant	Phalacrocorax sulcirostris	2
Australian Pelican	Pelecanus conspicillatus	1
Black-necked Stork	Ephippiorhynchus asiaticus	1
Eastern Great Egret	Ardea modesta	1
Intermediate Egret	Ardea intermedia	1
Striated Heron	Butorides striata	3
White-faced Heron	Egretta novaehollandiae	7
Eastern Reef Egret	Egretta sacra	20
Eastern Osprey	Pandion cristatus	7
White-bellied Sea-Eagle	Haliaeetus leucogaster	14
Brahminy Kite	Haliastur indus	16
Black Kite	Milvus migrans	1
Brown Goshawk	Accipiter fasciatus	4
Collared Sparrowhawk	Accipiter cirrocephalus	2
Nankeen Kestrel	Falco cenchroides	9
Brown Falcon	Falco berigora	7
Beach Stone-curlew	Esacus magnirostris	2
Australian Pied Oystercatcher	Haematopus longirostris	17
Sooty Oystercatcher	Haematopus fuliginosus	11
Pacific Golden Plover	Pluvialis fulva	2
Grey Plover	Pluvialis squatarola	1
Red-capped Plover	Charadrius ruficapillus	11
Lesser Sand Plover	Charadrius mongolus	2



Greater Sand Plover	Charadrius leschenaultii	8
Black-tailed Godwit	Limosa limosa	1
Bar-tailed Godwit	Limosa lapponica	1
Whimbrel	Numenius phaeopus	2
Eastern Curlew	Numenius madagascariensis	1
Terek Sandpiper	Xenus cinereus	1
Common Sandpiper	Actitis hypoleucos	7
Grey-tailed Tattler	Tringa brevipes	11
Ruddy Turnstone	Arenaria interpres	6
Asian Dowitcher	Limnodromus semipalmatus	1
Great Knot	Calidris tenuirostris	1
Red Knot	Calidris canutus	1
Sanderling	Calidris alba	3
Red-necked Stint	Calidris ruficollis	3
Curlew Sandpiper	Calidris ferruginea	1
Common Noddy	Anous stolidus	1
Little Tern	Sternula albifrons	1
Gull-billed Tern	Gelochelidon nilotica	2
Caspian Tern	Hydroprogne caspia	3
Roseate Tern	Sterna dougallii	1
Common Tern	Sterna hirundo	4
Lesser Crested Tern	Thalasseus bengalensis	3
Crested Tern	Thalasseus bergii	11
Silver Gull	Chroicocephalus novaehollandiae	18
Red-tailed Black-Cockatoo	Calyptorhynchus banksii	7
Little Corella	Cacatua sanguinea	1
Rainbow Lorikeet	Trichoglossus haematodus	2
Red-winged Parrot	Aprosmictus erythropterus	10
Budgerigar	Melopsittacus undulatus	1
Pheasant Coucal	Centropus phasianinus	2
Horsfield's Bronze-Cuckoo	Chalcites basalis	1
Pallid Cuckoo	Cacomantis pallidus	1
Brush Cuckoo	Cacomantis variolosus	1
Blue-winged Kookaburra	Dacelo leachii	2
Sacred Kingfisher	Todiramphus sanctus	2
Rainbow Bee-eater	Merops ornatus	18
Great Bowerbird	Ptilonorhynchus nuchalis	17
Red-backed Fairy-wren	Malurus melanocephalus	7
Variegated Fairy-wren	Malurus lamberti	1
Mangrove Gerygone	Gerygone levigaster	1
White-throated Gerygone	Gerygone albogularis	2
Singing Honeyeater	Lichenostomus virescens	24
White-gaped Honeyeater	Lichenostomus unicolor	7
Brown Honeyeater	Lichmera indistincta	10
White-throated Honeyeater	Melithreptus albogularis	1
Little Friarbird	Philemon citreogularis	12
Grey-crowned Babbler	Pomatostomus temporalis	9
Black-faced Cuckoo-shrike	Coracina novaehollandiae	14
White-winged Triller	Lalage sueurii	1
Rufous Whistler	Pachycephala rufiventris	7




Grey Shrike-thrush	Colluricincla harmonica	16
Olive-backed Oriole	Oriolus sagittatus	3
White-breasted Woodswallow	Artamus leucorhynchus	8
Masked Woodswallow	Artamus personatus	1
Black-faced Woodswallow	Artamus cinereus	5
Pied Butcherbird	Cracticus nigrogularis	6
Grey Fantail	Rhipidura albiscapa	2
Willie Wagtail	Rhipidura leucophrys	13
Torresian Crow	Corvus orru	8
Restless Flycatcher	Myiagra inquieta	2
Magpie-lark	Grallina cyanoleuca	2
Golden-headed Cisticola	Cisticola exilis	1
Fairy Martin	Petrochelidon ariel	1
Tree Martin	Petrochelidon nigricans	6
Mistletoebird	Dicaeum hirundinaceum	8
Double-barred Finch	Taeniopygia bichenovii	1
Long-tailed Finch	Poephila acuticauda	2
Australasian Pipit	Anthus novaeseelandiae	1
Crow & Raven species		1
		551



Rindata - Maps and Lists
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birdata



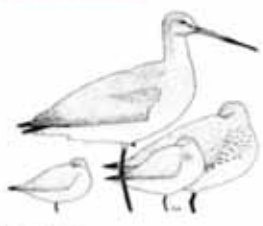
group site iba my data the atlas maps & lists custom lists help home login

Atlas Distribution Maps

Currently displayed: Atlas no. 152

Black-tailed Godwit


Limosa limosa



Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)



Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new


Reporting Rates

Survey Effort

<http://www.birddata.com.au/maps.htm>

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Atlas Distribution Maps

Currently displayed: Atlas no. 152

Brown Booby

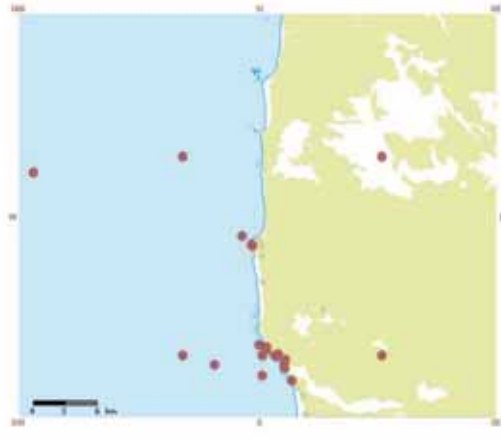
Sula leucogaster



Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)



Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

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Birddata - Maps and Lists

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birddata

Atlas Distribution Maps

Currently displayed: Atlas no. 112

Caspian Tern

Hydroprogne caspia

© Debbie Sullivan

[View species profile @ Birds in Backyards](#)

Filter records by month: All Months

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Map tools: [Get List](#)

Bird Distribution Layers | Legend

Atlas old
Atlas new

Reporting Rates

Survey Effort

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Birddata - Maps and Lists

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Atlas Distribution Maps

Currently displayed: Atlas no. 122

Common Noddy

Anous stolidus

© Kevin Burkhart

Filter records by month: All Months

[group site](#) [iba](#) [my data](#) [the atlas](#) [maps & lists](#) [custom lists](#) [help](#) [home](#) [login](#)

Map tools: [Get List](#)

Bird Distribution Layers | Legend

Atlas old
Atlas new

Reporting Rates

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Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

<http://www.birddata.com.au/maps.vm>

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Atlas Distribution Maps

Currently displayed: Atlas no. 157

Common Sandpiper

Actitis hypoleucos



© Andrew Stuckes

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Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also available

Map another species by common name or RAOU number:

100 0 100

100 0 100

Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort

http://www.birdata.com.au/maps.htm

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Atlas Distribution Maps

Currently displayed: Atlas no. 953

Common Tern

Sterna hirundo



© Kevin Barham

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Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also available

Map another species by common name or RAOU number:

100 0 100

100 0 100

Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

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http://www.birdata.com.au/maps.htm

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Page 1 of 2

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Atlas Distribution Maps

Currently displayed: Atlas no. 161

Curlew Sandpiper

Calidris ferruginea

© Avian Rogers

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Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

[group site](#) [iba](#) [my data](#) [the atlas](#) [maps+lists](#) [custom lists](#) [help](#) [home](#) [login](#)

Map tools: [Get List](#)

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort

<http://www.birddata.com.ua/maps.htm>

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Birddata - Maps and Lists

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Atlas Distribution Maps

Currently displaying: Atlas no. 148

Eastern Curlew

Numenius madagascariensis

© Robert Mearns

[View species profile @ Birds in Backyards](#)

Filter records by month:

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

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Map tools: [Get List](#)

Bird Distribution Layers | Legend

Atlas old
Atlas new

Reporting Rates

Survey Effort

<https://www.birddata.com/authors.htm>

7/8/09/2000



Birdata - Maps and Lists

Page 1 of 2

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Atlas Distribution Maps

Currently displaying: Atlas no. 5K1

Eastern Osprey

Pandion cristatus

© Andrew Plast

[View species profile @ Birds in Backyards](#)

Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

[group site](#) [iba](#) [my data](#) [the atlas](#) [maps & lists](#) [custom lists](#) [help](#) [home](#) [login](#)

Map tools: [Get List](#)

Bird Distribution Layers | Legend

Atlas old
Atlas new

Reporting Rates

Survey Effort

http://www.birdata.com.au/maps_vrn

26/09/2009

Birdata - Maps and Lists

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Atlas Distribution Maps

Currently displayed: Atlas no. 181

Eastern Reef Egret

Egretta sacra

© Barry Adcock

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Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

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Map tools:

Bird Distribution Layers | Legend

Atlas old
 Atlas new

Reporting Rates
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Survey Effort

<http://www.birdata.com/us/maps.htm>

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Birdata - Maps and Lists

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Atlas Distribution Maps

Currently displayed: Atlas no. 208

Fork-tailed Swift

Apus pacificus

© Nic Day

Filter records by month: All Months

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Map tools:

Bird Distribution Layers | Legend

Atlas old
 Atlas new

Reporting Rates
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Survey Effort

<http://www.birdata.com/us/maps.htm>

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Atlas Distribution Maps

Currently displayed: Atlas no. 108

Great Knot

Calidris tenuirostris



© Anne Rogers


Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

Map another species by common name or RAOU number:

Clear currently displayed species



Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort

<http://www.birdata.com.au/maps.htm>

28/09/2009

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Atlas Distribution Maps

Currently displayed: Atlas no. 141

Greater Sand Plover

Charadrius leschenaultii



© Neil Lynam

Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

Map another species by common name or RAOU number:



Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort

<http://www.birdata.com.au/maps.htm>

28/09/2009



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Atlas Distribution Maps

Currently displayed: Atlas no. 138

Grey Plover

Pluvialis squatarola



© Robert Mearns

View species profile @ Birds in Backyards

Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also available

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Atlas Distribution Maps

Currently displayed: Atlas no. 156

Grey-tailed Tattler

Tringa brevipes



© Andrew Stoddart

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Filter records by month: All Months

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort

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Atlas Distribution Maps

Currently displayed: Atlas no. 156

Grey-tailed Tattler

Tringa brevipes



© Andrew Stoddart

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Filter records by month: All Months

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

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Atlas Distribution Maps

Currently displayed: Atlas no. 156

Grey-tailed Tattler

Tringa brevipes



© Andrew Stoddart

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Filter records by month: All Months

Bird Distribution Layers | Legend

Atlas old

Atlas new


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Atlas Distribution Maps

Currently displayed: Atlas no. 911

Leach's Storm-Petrel
Hydrobates leucorhoa





Image unavailable

Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#).

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Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort

<http://www.birddata.com.au/maps.htm>
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Atlas Distribution Maps

Currently displayed: Atlas no. 118

Lesser Crested Tern
Thalasseus bengalensis



© Justin Peter

Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#).

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Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates


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Map another species by common name or RAOU number;

 Clear currently displayed species

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Atlas Distribution Maps

Currently displayed: Atlas no. 95

Lesser Frigatebird

Fregata ariel



© Andrew Plant

Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

Map tools: Move Map

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

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http://www.birdata.com.au/maps_v01

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Atlas Distribution Maps

Currently displayed: Atlas no. 139

Lesser Sand Plover

Charadrius mongolus



© Andrew Skelton

Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort

Map another species by common name or RAOU number:


Clear currently displayed species

http://www.birdata.com.au/maps_v01

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Atlas Distribution Maps

Currently displayed: Atlas no. 117

Little Tern

Sternula albifrons



© Karen Bellman


View species profile @ Birds in Backyards

Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

Map another species by common name or RAOU number:



Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort

<http://www.birdata.com.au/maps.htm>

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Atlas Distribution Maps

Currently displayed: Atlas no. 137

Pacific Golden Plover

Pluvialis fulva



© Robert Maschke

View species profile @ Birds in Backyards

Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

Map another species by common name or RAOU number:



Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates


Survey Effort

<http://www.birdata.com.au/maps.htm>

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Atlas Distribution Maps

Currently displayed: Atlas no. 329

Rainbow Bee-eater


Merops ornatus



© Debbie Sullivan

View species profile @ Birds in Backyards

Filter records by month: All Months



Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort

http://www.birdata.com.au/maps.vm

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Atlas Distribution Maps

Currently displayed: Atlas no. 154

Red Knot

Calidris canutus



© Anne Rogers

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Filter records by month: All Months



Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

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Atlas Bird Lists


To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also available

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Atlas Distribution Maps

Currently displayed: Atlas no. 162

Red-necked Stint

Calidris ruficollis



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Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

Reporting Rates

Survey Effort

Atlas old

Atlas new

Bird Distribution Layers | Legend

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Atlas Distribution Maps

Currently displayed: Atlas no. 113

Roseate Tern

Sterna dougallii



Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

Reporting Rates

Survey Effort


Atlas old

Atlas new

Bird Distribution Layers | Legend

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Atlas Distribution Maps

Currently displayed: Atlas no. 129

Ruddy Turnstone

Arenaria interpres



© Debbie Sullivan


View species profile @ Birds in Backyards

Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

Map another species by common name or RAOU number:



Map tools: Get List

Bird Distribution Layers | Legend

Atlas old


Atlas new

Reporting Rates

Survey Effort

<http://www.birdata.com.au/maps/129>
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Atlas Distribution Maps

Currently displayed: Atlas no. 188

Sanderling

Calidris alba



© Andrew Rogers


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Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

Map another species by common name or RAOU number:



Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort

<http://www.birdata.com.au/maps/188>
28/09/2009



birdata


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Atlas Distribution Maps

Currently displayed: Atlas no. 528

White-bellied Sea-Eagle

Haliaeetus leucogaster



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Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also available

Map tools: Get List

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort

http://www.birdata.com.au/maps.vns

26/09/2009

birdata


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Atlas Distribution Maps

Currently displayed: Atlas no. 53

Wilson's Storm-Petrel

Oceanites oceanicus



© Nic Day

Filter records by month: All Months

Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also available

Map tools: Zoom In

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort

http://www.birdata.com.au/maps.vns

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Appendix C: NatureMap Report and Species Location Maps for the Study Area





Guest User Search – 30/09/2009

NatureMap Bird Species Search Results for James Price Point Coastal Area

Method='By Rectangle'; Extent=121°58' 05" E, 122°17' 55" E, 17°17' 25" S, 17°37' 30" S; Species Group= Birds; Group By=Family;

Family	Species	Records
Apodidae	1	1
Burhinidae	1	1
Centropodidae	1	1
Columbidae	1	1
Dicruridae	1	1
Falconidae	1	1
Hirundinidae	1	1
Laridae	2	5
Maluridae	1	2
Meliphagidae	3	5
Pachycephalidae	2	2
TOTAL	15	21

Apodidae

[Apus pacificus subsp. pacificus](#)

1 species, 1 records

Burhinidae

[Esacus neglectus](#) Beach Stone-curlew

1 species, 1 records

Centropodidae

[Centropus phasianinus subsp. phasianinus](#)

1 species, 1 records

Columbidae

[Geopelia striata subsp. placida](#)

1 species, 1 records

Dicruridae

[Rhipidura fuliginosa subsp. alisteri](#)

1 species, 1 records

Falconidae

[Falco peregrinus subsp. macropus](#) S

1 species, 1 records

Hirundinidae

[Hirundo nigricans subsp. nigricans](#)

1 species, 1 records

Laridae

[Larus novaehollandiae subsp. novaehollandiae](#)

[Sterna dougallii subsp. gracilis](#)

2 species, 5 records

Maluridae

[Malurus lamberti subsp. assimilis](#)

1 species, 2 records

Meliphagidae

[Lichenostomus flavescens subsp. flavescens](#)

[Lichenostomus unicolor subsp. unicolor](#)

[Melithreptus gularis subsp. laetior](#)

3 species, 5 records



Pachycephalidae

[Colluricincla harmonica subsp. rufiventris](#)

[Pachycephala lanioides](#) **White-breasted Whistler**

2 species, 2 records

Conservation Status

T - Rare or likely to become extinct

X - Presumed extinct

IA - Protected under international agreement

S - Other specially protected fauna

1 - Priority 1

2 - Priority 2

3 - Priority 3

4 - Priority 4

5 - Priority 5



NatureMap Bird Species Report for James Price Point Coastal Area

Created By Guest user on 30/09/2009

Species Group: Birds

Method: 'By Rectangle'

Extent: 121°58' 00" E, 122°17' 50" E, 17°17' 20" S, 17°37' 30" S

Area (ha)	130557.04
Taxa:	
Naturalised	0
Native	15
Endemics:	0
Families:	11
Genera:	14
Conservation Status:	
S	1
-	14
MS Status:	
-	15
Rank:	
subsp.	13
-	2

Top Ten Families

	Species	Records
1. Laridae	2	5
2. Meliphagidae	3	5
3. Maluridae	1	2
4. Pachycephalidae	2	2
5. Apodidae	1	1
6. Burhinidae	1	1
7. Centropodidae	1	1
8. Columbidae	1	1
9. Dicruridae	1	1
10. Falconidae	1	1

Top Ten Genera

	Species	Records
1. Lichenostomus	2	4
2. Sterna	1	4
3. Malurus	1	2
4. Apus	1	1
5. Centropus	1	1
6. Colluricincla	1	1
7. Esacus	1	1
8. Pachycephala	1	1
9. Rhipidura	1	1
10. Malthreptus	1	1



Endemic To Query Area

Name ID Species

Conservation Status



Record Location Maps for Migratory Bird Species

-  **Selected Species Points**
-  **Selected Points**

Fork-tailed Swift



Roseate Tern



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Appendix D: EPBC Protected Matters Report for the Study Area



Protected Matters Search Tool

You are here: [Environment Home](#) > [EPBC Act](#) > [Search](#)

28 September 2009 12:56

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Information on the coverage of this report and qualifications on data supporting this report are contained in the [caveat](#) at the end of the report.

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: -17.59915,122.2412, -17.34604,122.2329, -17.34576,122.1623, -17.30509,122.1625, -17.30906,122.0401, -17.39946,122.0444, -17.4357,122.063, -17.60294,122.0692



This map may contain data which are:
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 Commonwealth Australia
 © 2007 MapInfo Software Pty Ltd, P10040

Report Contents: [Summary](#)
[Details](#)
 • [Matters of NES](#)
 • [Other matters protected by the EPBC Act](#)
 • [Extra Information](#)

[Caveat](#)
[Acknowledgments](#)

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:](#) 1
 (Ramsar Sites)

http://www.environment.gov.au/cgi-bin/erin/ert/epbc/epbc_report.pl?searchtype=area;latdec=;latmin=;latsec=0;londec=;lonmin=;lonsec=0 28/09/2009



Commonwealth Marine Areas:	Relevant
Threatened Ecological Communities:	None
Threatened Species:	16
Migratory Species:	30

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:	1
Listed Marine Species:	62
Whales and Other Cetaceans:	12
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:	1
Other Commonwealth Reserves:	None
Regional Forest Agreements:	None

Details

Matters of National Environmental Significance

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

[ROEBUCK BAY](#)

Within same catchment as Ramsar site

Commonwealth Marine Areas [[Dataset Information](#)]

Approval may be required for a proposed activity that is likely to have a significant impact on the environment in a Commonwealth Marine Area, when the action is outside the Commonwealth Marine Area, or the environment anywhere when the action is taken within the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

EEZ and Territorial Sea



Threatened Species [[Dataset Information](#)]**Birds**[Erythrura gouldiae](#)

Gouldian Finch

Status Type of Presence

Endangered Species or species habitat may occur within area

[Rostratula australis](#)

Australian Painted Snipe

Vulnerable Species or species habitat may occur within area

[Tyto novaehollandiae kimberli](#)

Masked Owl (northern)

Vulnerable Species or species habitat may occur within area

Mammals[Balaenoptera musculus](#)

Blue Whale

Endangered Species or species habitat may occur within area

[Dasyercus cristicauda](#)

Mulgara

Vulnerable Species or species habitat likely to occur within area

[Macrotis lagotis](#)

Greater Bilby

Vulnerable Species or species habitat may occur within area

[Megaptera novaeangliae](#)

Humpback Whale

Vulnerable Breeding known to occur within area

[Xeromys myoides](#)

Water Mouse, False Water Rat

Vulnerable Species or species habitat may occur within area

Reptiles[Caretta caretta](#)

Loggerhead Turtle

Endangered Species or species habitat may occur within area

[Chelonia mydas](#)

Green Turtle

Vulnerable Species or species habitat may occur within area

[Dermochelys coriacea](#)

Leatherback Turtle, Leathery Turtle, Luth

Endangered Species or species habitat may occur within area

[Eretmochelys imbricata](#)

Hawksbill Turtle

Vulnerable Species or species habitat may occur within area

[Natator depressus](#)

Flatback Turtle

Vulnerable Species or species habitat may occur within area

Sharks[Pristis microdon](#)

Freshwater Sawfish

Vulnerable Species or species habitat likely to occur within area

[Pristis zijsron](#)

Green Sawfish, Dindagubba, Narrowsnout Sawfish

Vulnerable Species or species habitat may occur within area

[Rhincodon typus](#)

Whale Shark

Vulnerable Species or species habitat may occur within area

Migratory Species [[Dataset Information](#)]**Migratory Terrestrial Species****Birds**[Erythrura gouldiae](#)

Gouldian Finch

Migratory Species or species habitat may occur within area

[Haliaeetus leucogaster](#)

White-bellied Sea-Eagle

Migratory Species or species habitat likely to occur within area

[Hirundo rustica](#)

Barn Swallow

Migratory Species or species habitat may occur within area

[Merops ornatus](#)

Rainbow Bee-eater

Migratory Species or species habitat may occur within area

Migratory Wetland Species**Birds**[Ardea alba](#)

Great Egret, White Egret

Migratory Species or species habitat may occur within area

[Ardea ibis](#)

Cattle Egret

Migratory Species or species habitat may occur within area



EPBC Act Protected Matters Report		Page 4 of 9
<i>Charadrius veredus</i> Oriental Plover, Oriental Dotterel	Migratory	Species or species habitat may occur within area
<i>Glareola maldivarum</i> Oriental Pratincole	Migratory	Foraging, feeding or related behaviour may occur within area
<i>Rostratula benghalensis s. lat.</i> Painted Snipe	Migratory	Species or species habitat may occur within area
Migratory Marine Birds		
<i>Apus pacificus</i> Fork-tailed Swift	Migratory	Species or species habitat may occur within area
<i>Ardea alba</i> Great Egret, White Egret	Migratory	Species or species habitat may occur within area
<i>Ardea ibis</i> Cattle Egret	Migratory	Species or species habitat may occur within area
<i>Calonectris leucomelas</i> Streaked Shearwater	Migratory	Species or species habitat may occur within area
<i>Puffinus leucomelas</i> Streaked Shearwater	Migratory	Species or species habitat may occur within area
<i>Sterna albigula</i> Little Tern	Migratory	Species or species habitat may occur within area
Migratory Marine Species		
Mammals		
<i>Balaenoptera edeni</i> Bryde's Whale	Migratory	Species or species habitat may occur within area
<i>Balaenoptera musculus</i> Blue Whale	Migratory	Species or species habitat may occur within area
<i>Dugong dugon</i> Dugong	Migratory	Species or species habitat likely to occur within area
<i>Megaptera novaeangliae</i> Humpback Whale	Migratory	Breeding known to occur within area
<i>Orcaella brevirostris</i> Irrawaddy Dolphin	Migratory	Species or species habitat may occur within area
<i>Orcinus orca</i> Killer Whale, Orca	Migratory	Species or species habitat may occur within area
<i>Sousa chinensis</i> Indo-Pacific Humpback Dolphin	Migratory	Species or species habitat may occur within area
<i>Tursiops aduncus (Aratura/Timor Sea populations)</i> Spotted Bottlenose Dolphin (Aratura/Timor Sea populations)	Migratory	Species or species habitat likely to occur within area
Reptiles		
<i>Caretta caretta</i> Loggerhead Turtle	Migratory	Species or species habitat may occur within area
<i>Chelonia mydas</i> Green Turtle	Migratory	Species or species habitat may occur within area
<i>Crocodylus porosus</i> Estuarine Crocodile, Salt-water Crocodile	Migratory	Species or species habitat likely to occur within area
<i>Dermochelys coriacea</i> Leatherback Turtle, Leathery Turtle, Luth	Migratory	Species or species habitat may occur within area
<i>Eretmochelys imbricata</i> Hawksbill Turtle	Migratory	Species or species habitat may occur within area
<i>Natator depressus</i> Flatback Turtle	Migratory	Species or species habitat may occur within area
Sharks		
<i>Rhincodon typus</i> Whale Shark	Migratory	Species or species habitat may occur within area

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Other Matters Protected by the EPBC ActListed Marine Species [[Dataset Information](#)]

	Status	Type of Presence
Birds		
Anseranas semipalmata Magpie Goose	Listed - overfly marine area	Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift	Listed - overfly marine area	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Listed - overfly marine area	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Listed - overfly marine area	Species or species habitat may occur within area
Calonectris leucomelas Streaked Shearwater	Listed	Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel	Listed - overfly marine area	Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole	Listed - overfly marine area	Foraging, feeding or related behaviour may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle	Listed	Species or species habitat likely to occur within area
Hirundo rustica Barn Swallow	Listed - overfly marine area	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater	Listed - overfly marine area	Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe	Listed - overfly marine area	Species or species habitat may occur within area
Sterna albitrons Little Tern	Listed	Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong	Listed	Species or species habitat likely to occur within area
Ray-finned fishes		
Campichthys tricarinatus Three-keel Pipefish	Listed	Species or species habitat may occur within area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish	Listed	Species or species habitat may occur within area
Choerichthys suillus Pig-snouted Pipefish	Listed	Species or species habitat may occur within area
Corythoichthys flavofasciatus Yellow-banded Pipefish, Network Pipefish	Listed	Species or species habitat may occur within area
Cosmocampus banneri Roughridge Pipefish	Listed	Species or species habitat may occur within area

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EPBC Act Protected Matters Report		Page 6 of 9
<i>Doryrhamphus excisus</i> Indian Blue-stripe Pipefish, Blue-stripe Pipefish	Listed	Species or species habitat may occur within area
<i>Doryrhamphus janssi</i> Cleaner Pipefish, Janss' Pipefish	Listed	Species or species habitat may occur within area
<i>Filicampus tigris</i> Tiger Pipefish	Listed	Species or species habitat may occur within area
<i>Halicampus brocki</i> Brock's Pipefish	Listed	Species or species habitat may occur within area
<i>Halicampus gravi</i> Mud Pipefish, Gray's Pipefish	Listed	Species or species habitat may occur within area
<i>Halicampus nitidus</i> Glittering Pipefish	Listed	Species or species habitat may occur within area
<i>Halicampus spinirostris</i> Spiny-snout Pipefish	Listed	Species or species habitat may occur within area
<i>Haliichthys taeniophorus</i> Ribbioned Seadragon, Ribbioned Pipefish	Listed	Species or species habitat may occur within area
<i>Hippichthys penicillatus</i> Beady Pipefish, Steep-nosed Pipefish	Listed	Species or species habitat may occur within area
<i>Hippocampus histrix</i> Spiny Seahorse	Listed	Species or species habitat may occur within area
<i>Hippocampus kuda</i> Spotted Seahorse, Yellow Seahorse	Listed	Species or species habitat may occur within area
<i>Hippocampus planifrons</i> Flat-face Seahorse	Listed	Species or species habitat may occur within area
<i>Hippocampus spinosissimus</i> Hedgehog Seahorse	Listed	Species or species habitat may occur within area
<i>Micrognathus micronotopterus</i> Tidepool Pipefish	Listed	Species or species habitat may occur within area
<i>Solegnathus hardwickii</i> Pipehorse	Listed	Species or species habitat may occur within area
<i>Solegnathus lettiensis</i> Indonesian Pipefish, Gunther's Pipehorse	Listed	Species or species habitat may occur within area
<i>Solenostomus cyanopterus</i> Blue-finned Ghost Pipefish, Robust Ghost Pipefish	Listed	Species or species habitat may occur within area
<i>Syngnathoides biaculeatus</i> Double-ended Pipehorse, Alligator Pipefish	Listed	Species or species habitat may occur within area
<i>Trachyrhamphus bicoarctatus</i> Bend Stick Pipefish, Short-tailed Pipefish	Listed	Species or species habitat may occur within area
<i>Trachyrhamphus longirostris</i> Long-nosed Pipefish, Straight Stick Pipefish	Listed	Species or species habitat may occur within area
Reptiles		
<i>Acalyptophis peronii</i> Horned Seasnake	Listed	Species or species habitat may occur within area
<i>Aipysurus apraefrontalis</i> Short-nosed Seasnake	Listed	Species or species habitat may occur within area
<i>Aipysurus duboisii</i> Dubois' Seasnake	Listed	Species or species habitat may occur within area
<i>Aipysurus eydouxii</i> Spine-tailed Seasnake	Listed	Species or species habitat may occur within area
<i>Aipysurus laevis</i> Olive Seasnake	Listed	Species or species habitat may occur within area
<i>Aipysurus tenuis</i> Brown-lined Seasnake	Listed	Species or species habitat may occur within area
<i>Astrotia stokesii</i> Stokes' Seasnake	Listed	Species or species habitat may occur within area
http://www.environment.gov.au/cgi-bin/crp/crt/epbc/crbs_report.pl?searchtype=area&latdec=latmin=latsec=0&londeg= 28/09/2009		



EPBC Act Protected Matters Report		Page 7 of 9
<i>Caretta caretta</i> Loggerhead Turtle	Listed	Species or species habitat may occur within area
<i>Chelonia mydas</i> Green Turtle	Listed	Species or species habitat may occur within area
<i>Crocodylus johnstoni</i> Freshwater Crocodile	Listed	Species or species habitat may occur within area
<i>Crocodylus porosus</i> Estuarine Crocodile, Salt-water Crocodile	Listed	Species or species habitat likely to occur within area
<i>Dermochelys coriacea</i> Leatherback Turtle, Leathery Turtle, Luth	Listed	Species or species habitat may occur within area
<i>Disteira kingii</i> Spectacled Seasnake	Listed	Species or species habitat may occur within area
<i>Disteira major</i> Olive-headed Seasnake	Listed	Species or species habitat may occur within area
<i>Emydocephalus annulatus</i> Turtle-headed Seasnake	Listed	Species or species habitat may occur within area
<i>Ephalophis greyi</i> North-western Mangrove Seasnake	Listed	Species or species habitat may occur within area
<i>Eretmochelys imbricata</i> Hawksbill Turtle	Listed	Species or species habitat may occur within area
<i>Hydrelaps darwiniensis</i> Black-ringed Seasnake	Listed	Species or species habitat may occur within area
<i>Hydrophis elegans</i> Elegant Seasnake	Listed	Species or species habitat may occur within area
<i>Hydrophis mcdowelli</i>	Listed	Species or species habitat may occur within area
<i>Hydrophis ornatus</i> a seasnake	Listed	Species or species habitat may occur within area
<i>Lapemis hardwickii</i> Spine-bellied Seasnake	Listed	Species or species habitat may occur within area
<i>Natator depressus</i> Flatback Turtle	Listed	Species or species habitat may occur within area
<i>Pelamis platurus</i> Yellow-bellied Seasnake	Listed	Species or species habitat may occur within area
Whales and Other Cetaceans [Dataset Information]	Status	Type of Presence
<i>Balaenoptera edeni</i> Bryde's Whale	Cetacean	Species or species habitat may occur within area
<i>Balaenoptera musculus</i> Blue Whale	Cetacean	Species or species habitat may occur within area
<i>Delphinus delphis</i> Common Dolphin, Short-beaked Common Dolphin	Cetacean	Species or species habitat may occur within area
<i>Grampus griseus</i> Risso's Dolphin, Grampus	Cetacean	Species or species habitat may occur within area
<i>Megaptera novaeangliae</i> Humpback Whale	Cetacean	Breeding known to occur within area
<i>Orcaella brevirostris</i> Irrawaddy Dolphin	Cetacean	Species or species habitat may occur within area
<i>Orcinus orca</i> Killer Whale, Orca	Cetacean	Species or species habitat may occur within area
<i>Sousa chinensis</i> Indo-Pacific Humpback Dolphin	Cetacean	Species or species habitat may occur within area
<i>Stenella attenuata</i> Spotted Dolphin, Pantropical Spotted Dolphin	Cetacean	Species or species habitat may occur within area
<i>Tursiops aduncus (Arafura/Timor Sea populations)</i> Spotted Bottlenose Dolphin (Arafura/Timor Sea populations)	Cetacean	Species or species habitat likely to occur within area

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[Tursiops aduncus](#)

Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin

Cetacean Species or species habitat likely to occur within area

[Tursiops truncatus s. str.](#)

Bottlenose Dolphin

Cetacean Species or species habitat may occur within area

Places on the RNE [[Dataset Information](#)]
 Note that not all Indigenous sites may be listed.

Natural[Coulomb Point Nature Reserve WA](#)**Extra Information**State and Territory Reserves [[Dataset Information](#)]

Coulomb Point Nature Reserve, WA

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.

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Appendix E: Birdata Atlas List and Species Distribution Maps for Migratory Bird Species on the West Coast of the Dampier Peninsula



Bird list for one degree square containing the point 122.15007, -17.44835

Common Name	Scientific Name	Species Profile	Map Species
Brown Quail	<i>Coturnix ypsilophora</i>	view	map
Indian Peafowl	<i>Pavo cristatus</i>		map
Magpie Goose	<i>Anseranas semipalmata</i>	view	map
Plumed Whistling-Duck	<i>Dendrocygna eytoni</i>	view	map
Wandering Whistling-Duck	<i>Dendrocygna arcuata</i>	view	map
Freckled Duck	<i>Stictonetta naevosa</i>	view	map
Black Swan	<i>Cygnus atratus</i>	view	map
Radjah Shelduck	<i>Tadorna radjah</i>		map
Australian Shelduck	<i>Tadorna tadornoides</i>	view	map
Australian Wood Duck	<i>Chenonetta jubata</i>	view	map
Pink-eared Duck	<i>Malacorhynchus membranaceus</i>	view	map
Green Pygmy-goose	<i>Nettapus pulchellus</i>		map
Garganey	<i>Anas querquedula</i>		map
Australasian Shoveler	<i>Anas rhynchotis</i>	view	map
Grey Teal	<i>Anas gracilis</i>	view	map
Chestnut Teal	<i>Anas castanea</i>	view	map
Pacific Black Duck	<i>Anas superciliosa</i>	view	map
Hardhead	<i>Aythya australis</i>	view	map
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	view	map
Hoary-headed Grebe	<i>Poliocephalus poliocephalus</i>	view	map
Great Crested Grebe	<i>Podiceps cristatus</i>	view	map
Rock Dove	<i>Columba livia</i>	view	map
Flock Bronzewing	<i>Phaps histrionica</i>		map
Crested Pigeon	<i>Ocyphaps lophotes</i>	view	map
Diamond Dove	<i>Geopelia cuneata</i>		map
Peaceful Dove	<i>Geopelia striata</i>	view	map
Bar-shouldered Dove	<i>Geopelia humeralis</i>	view	map
Pied Imperial-Pigeon	<i>Ducula bicolor</i>		map
Tawny Frogmouth	<i>Podargus strigoides</i>	view	map
Spotted Nightjar	<i>Eurostopodus argus</i>		map
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>	view	map
White-throated Needletail	<i>Hirundapus caudacutus</i>	view	map
Fork-tailed Swift	<i>Apus pacificus</i>		map
House Swift	<i>Apus affinis</i>		map
Leach's Storm-Petrel	<i>Hydrobates leucorhoa</i>		map
Wilson's Storm-Petrel	<i>Oceanites oceanicus</i>		map
Bulwer's Petrel	<i>Bulweria bulwerii</i>		map
Wedge-tailed Shearwater	<i>Ardena pacifica</i>		map
Short-tailed Shearwater	<i>Ardena tenuirostris</i>	view	map
Streaked Shearwater	<i>Calonectris leucomelas</i>		map
Hutton's Shearwater	<i>Puffinus huttoni</i>		map



Bird List		Page 2 of 7	
Lesser Frigatebird	Fregata ariel		map
Brown Booby	Sula leucogaster		map
Australasian Darter	Anhinga novaehollandiae	view	map
Little Pied Cormorant	Microcarbo melanoleucos	view	map
Great Cormorant	Phalacrocorax carbo	view	map
Little Black Cormorant	Phalacrocorax sulcirostris	view	map
Pied Cormorant	Phalacrocorax varius	view	map
Australian Pelican	Pelecanus conspicillatus	view	map
Black-necked Stork	Ephippiorhynchus asiaticus	view	map
Australian Little Bittern	Ixobrychus dubius		map
Black Bittern	Ixobrychus flavicollis	view	map
White-necked Heron	Ardea pacifica	view	map
Eastern Great Egret	Ardea modesta	view	map
Intermediate Egret	Ardea intermedia		map
Cattle Egret	Ardea ibis	view	map
Striated Heron	Butorides striata	view	map
Pied Heron	Egretta picata		map
White-faced Heron	Egretta novaehollandiae	view	map
Little Egret	Egretta garzetta	view	map
Eastern Reef Egret	Egretta sacra	view	map
Nankeen Night-Heron	Nycticorax caledonicus	view	map
Glossy Ibis	Plegadis falcinellus	view	map
Australian White Ibis	Threskiornis molucca	view	map
Straw-necked Ibis	Threskiornis spinicollis	view	map
Royal Spoonbill	Platalea regia	view	map
Yellow-billed Spoonbill	Platalea flavipes	view	map
Eastern Osprey	Pandion cristatus	view	map
Black-shouldered Kite	Elanus axillaris	view	map
Square-tailed Kite	Lophoictinia isura		map
Black-breasted Buzzard	Hamirostra melanosternon	view	map
White-bellied Sea-Eagle	Haliaeetus leucogaster	view	map
Whistling Kite	Haliastur sphenurus	view	map
Brahminy Kite	Haliastur indus	view	map
Black Kite	Milvus migrans	view	map
Brown Goshawk	Accipiter fasciatus	view	map
Collared Sparrowhawk	Accipiter cirrocephalus	view	map
Grey Goshawk	Accipiter novaehollandiae	view	map
Spotted Harrier	Circus assimilis	view	map
Swamp Harrier	Circus approximans	view	map
Wedge-tailed Eagle	Aquila audax	view	map
Little Eagle	Hieraaetus morphnoides	view	map
Nankeen Kestrel	Falco cenchroides	view	map
Brown Falcon	Falco berigora	view	map
Australian Hobby	Falco longipennis		map
Grey Falcon	Falco hypoleucos		map

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Black Falcon	Falco subniger	view	map
Peregrine Falcon	Falco peregrinus	view	map
Brolga	Grus rubicunda	view	map
Purple Swamphen	Porphyrio porphyrio	view	map
Buff-banded Rail	Gallirallus philippensis	view	map
Baillon's Crake	Porzana pusilla		map
Australian Spotted Crake	Porzana fluminea		map
Spotless Crake	Porzana tabuensis		map
White-browed Crake	Amauornis cinerea		map
Black-tailed Native-hen	Tribonyx ventralis	view	map
Eurasian Coot	Fulica atra	view	map
Australian Bustard	Ardeotis australis	view	map
Bush Stone-curlew	Burhinus grallarius	view	map
Beach Stone-curlew	Esacus magnirostris	view	map
Australian Pied Oystercatcher	Haematopus longirostris	view	map
Sooty Oystercatcher	Haematopus fuliginosus	view	map
Black-winged Stilt	Himantopus himantopus	view	map
Red-necked Avocet	Recurvirostra novaehollandiae	view	map
Banded Stilt	Cladorhynchus leucocephalus	view	map
Pacific Golden Plover	Pluvialis fulva	view	map
Grey Plover	Pluvialis squatarola	view	map
Little Ringed Plover	Charadrius dubius		map
Red-capped Plover	Charadrius ruficapillus	view	map
Lesser Sand Plover	Charadrius mongolus		map
Greater Sand Plover	Charadrius leschenaultii		map
Oriental Plover	Charadrius veredus	view	map
Black-fronted Dotterel	Elseya melanops	view	map
Red-kneed Dotterel	Erythronyx cinctus	view	map
Banded Lapwing	Vanellus tricolor	view	map
Masked Lapwing	Vanellus miles	view	map
Comb-crested Jacana	Irediparra gallinacea	view	map
Australian Painted Snipe	Rostratula australis		map
Pin-tailed Snipe	Gallinago stenura		map
Swinhoe's Snipe	Gallinago megala		map
Black-tailed Godwit	Limosa limosa		map
Bar-tailed Godwit	Limosa lapponica	view	map
Little Curlew	Numenius minutus	view	map
Whimbrel	Numenius phaeopus	view	map
Eastern Curlew	Numenius madagascariensis	view	map
Terek Sandpiper	Xenus cinereus	view	map
Common Sandpiper	Actitis hypoleucos	view	map
Grey-tailed Tattler	Tringa brevipes	view	map
Common Greenshank	Tringa nebularia	view	map
Marsh Sandpiper	Tringa stagnatilis	view	map
Common Redshank	Tringa totanus		map

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Wood Sandpiper	Tringa glareola	view	map
Ruddy Turnstone	Arenaria interpres	view	map
Asian Dowitcher	Limnodromus semipalmatus		map
Great Knot	Calidris tenuirostris		map
Red Knot	Calidris canutus	view	map
Sanderling	Calidris alba	view	map
Red-necked Stint	Calidris ruficollis	view	map
Long-toed Stint	Calidris subminuta		map
Pectoral Sandpiper	Calidris melanotos		map
Sharp-tailed Sandpiper	Calidris acuminata	view	map
Curlew Sandpiper	Calidris ferruginea	view	map
Broad-billed Sandpiper	Limicola falcinellus		map
Ruff	Philomachus pugnax		map
Red-necked Phalarope	Phalaropus lobatus		map
Red-backed Button-quail	Turnix maculosus		map
Red-chested Button-quail	Turnix pyrrhothorax		map
Little Button-quail	Turnix velox		map
Oriental Pratincole	Glareola maldivarum		map
Australian Pratincole	Stiltia isabella	view	map
Arctic Jaeger	Stercorarius parasiticus		map
Common Noddy	Anous stolidus		map
Bridled Tern	Onychoprion anaethetus		map
Little Tern	Sternula albifrons	view	map
Fairy Tern	Sternula nereis	view	map
Gull-billed Tern	Gelochelidon nilotica	view	map
Caspian Tern	Hydroprogne caspia	view	map
Whiskered Tern	Chlidonias hybrida	view	map
White-winged Black Tern	Chlidonias leucopterus		map
Roseate Tern	Sterna dougallii		map
Common Tern	Sterna hirundo	view	map
Lesser Crested Tern	Thalasseus bengalensis		map
Crested Tern	Thalasseus bergii	view	map
Silver Gull	Chroicocephalus novaehollandiae	view	map
Sabine's Gull	Xema sabini		map
Red-tailed Black-Cockatoo	Calyptorhynchus banksii		map
Galah	Eolophus roseicapillus	view	map
Little Corella	Cacatua sanguinea	view	map
Cockatiel	Nymphicus hollandicus	view	map
Rainbow Lorikeet	Trichoglossus haematodus	view	map
Varied Lorikeet	Psitteuteles versicolor		map
Red-winged Parrot	Aprosmictus erythropterus	view	map
Budgerigar	Melopsittacus undulatus	view	map
Pheasant Coucal	Centropus phasianinus	view	map
Channel-billed Cuckoo	Scythrops novaehollandiae	view	map
Horsfield's Bronze-Cuckoo	Chalcites basalis	view	map
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Black-eared Cuckoo	Chalcites osculans	view	map
Little Bronze-Cuckoo	Chalcites minutillus		map
Pallid Cuckoo	Cacomantis pallidus	view	map
Brush Cuckoo	Cacomantis variolosus	view	map
Oriental Cuckoo	Cuculus optatus		map
Barking Owl	Ninox connivens	view	map
Southern Boobook	Ninox novaeseelandiae	view	map
Eastern Barn Owl	Tyto javanica	view	map
Eastern Grass Owl	Tyto longimembris	view	map
Blue-winged Kookaburra	Dacelo leachii	view	map
Red-backed Kingfisher	Todiramphus pyrrhopygius		map
Sacred Kingfisher	Todiramphus sanctus	view	map
Collared Kingfisher	Todiramphus chloris		map
Rainbow Bee-eater	Merops ornatus	view	map
Dollarbird	Eurystomus orientalis	view	map
Black-tailed Treecreeper	Climacteris melanura		map
Great Bowerbird	Ptilonorhynchus nuchalis		map
Red-backed Fairy-wren	Malurus melanocephalus		map
Variegated Fairy-wren	Malurus lamberti	view	map
Weebill	Smicromis brevirostris	view	map
Mangrove Gerygone	Gerygone levigaster		map
Western Gerygone	Gerygone fusca		map
Dusky Gerygone	Gerygone tenebrosa		map
White-throated Gerygone	Gerygone albogularis	view	map
Red-browed Pardalote	Pardalotus rubricatus		map
Striated Pardalote	Pardalotus striatus	view	map
Singing Honeyeater	Lichenostomus virescens	view	map
White-gaped Honeyeater	Lichenostomus unicolor		map
Grey-headed Honeyeater	Lichenostomus keartlandi		map
Yellow-tinted Honeyeater	Lichenostomus flavescens		map
White-fronted Honeyeater	Purnella albitrons	view	map
Yellow-throated Miner	Manorina flavigula	view	map
Spiny-cheeked Honeyeater	Acanthagenys rufogularis	view	map
Rufous-throated Honeyeater	Conopophila rufogularis		map
Orange Chat	Epthianura aurifrons		map
Yellow Chat	Epthianura crocea		map
Black Honeyeater	Sugomel niger	view	map
Red-headed Honeyeater	Myzomela erythrocephala		map
Banded Honeyeater	Cissomela pectoralis		map
Brown Honeyeater	Lichmera indistincta	view	map
Black-chinned Honeyeater	Melithreptus gularis	view	map
White-throated Honeyeater	Melithreptus albogularis		map
Little Friarbird	Philemon citreogularis	view	map
Grey-crowned Babbler	Pomatostomus temporalis	view	map
Varied Sittella	Daphoenositta chrysoptera	view	map

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Black-faced Cuckoo-shrike	Coracina novaehollandiae	view	map
White-bellied Cuckoo-shrike	Coracina papuensis		map
White-winged Triller	Lalage sueurii	view	map
Mangrove Golden Whistler	Pachycephala melanura		map
Rufous Whistler	Pachycephala rufiventris	view	map
White-breasted Whistler	Pachycephala lanioides		map
Grey Shrike-thrush	Colluricincla harmonica	view	map
Olive-backed Oriole	Oriolus sagittatus	view	map
White-breasted Woodswallow	Artamus leucorhynchus	view	map
Masked Woodswallow	Artamus personatus		map
White-browed Woodswallow	Artamus superciliosus	view	map
Black-faced Woodswallow	Artamus cinereus	view	map
Little Woodswallow	Artamus minor		map
Grey Butcherbird	Cracticus torquatus	view	map
Pied Butcherbird	Cracticus nigrogularis	view	map
Australian Magpie	Cracticus tibicen	view	map
Grey Fantail	Rhipidura albiscapa	view	map
Mangrove Grey Fantail	Rhipidura phasiana		map
Northern Fantail	Rhipidura rufiventris		map
Willie Wagtail	Rhipidura leucophrys	view	map
Little Crow	Corvus bennetti		map
Torresian Crow	Corvus orru	view	map
Broad-billed Flycatcher	Myiagra ruficollis		map
Leaden Flycatcher	Myiagra rubecula	view	map
Restless Flycatcher	Myiagra inquieta	view	map
Magpie-lark	Grallina cyanoleuca	view	map
Jacky Winter	Microeca fascians	view	map
Lemon-bellied Flycatcher	Microeca flavigaster		map
Red-capped Robin	Petroica goodenovii	view	map
Hooded Robin	Melanodryas cucullata	view	map
Horsfield's Bushlark	Mirafra javanica	view	map
Golden-headed Cisticola	Cisticola exilis	view	map
Australian Reed-Warbler	Acrocephalus australis	view	map
Tawny Grassbird	Megalurus timoriensis		map
Little Grassbird	Megalurus gramineus	view	map
Rufous Songlark	Cincloramphus mathewsi	view	map
Brown Songlark	Cincloramphus cruralis	view	map
Yellow White-eye	Zosterops luteus		map
Barn Swallow	Hirundo rustica		map
Welcome Swallow	Hirundo neoxena	view	map
Fairy Martin	Petrochelidon ariel	view	map
Tree Martin	Petrochelidon nigricans		map
Red-rumped Swallow	Cecropis daurica		map
Blue-and-White Flycatcher	Cyanoptila cyanomelana		map
Common Starling	Sturnus vulgaris	view	map

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Mistletoebird	Dicaeum hirundinaceum	view	map
Zebra Finch	Taeniopygia guttata	view	map
Double-barred Finch	Taeniopygia bichenovii	view	map
Long-tailed Finch	Poephila acuticauda		map
Painted Finch	Emblema pictum		map
Chestnut-breasted Mannikin	Lonchura castaneothorax	view	map
Pictorella Mannikin	Heteromunia pectoralis		map
Australasian Pipit	Anthus novaeseelandiae	view	map
Yellow Wagtail species	Motacilla flava		map
Domestic/Feral Duck			map
Snipe species			map
Crow & Raven species			map

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Atlas Distribution Maps

Currently displayed: Atlas no. 121

Bridled Tern

Onychoprion anaethetus

© Kevin Scharlem

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Map tools: Get List

Bird Distribution Layers | Legend

Atlas old	Reporting Rates	Survey Effort
Atlas new		

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Atlas Distribution Maps

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Common Greenshank

Tringa nebularia

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Oriental Plover

Charadrius veredus



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Atlas old

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Map tools: Get List

Atlas Distribution Maps

Currently displayed: Atlas no. 903

Streaked Shearwater

Calonectris leucomelas



© Kevin Barthelm

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Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#)

Bird Distribution Layers | Legend

Atlas old

Atlas new

Reporting Rates

Survey Effort


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May 2010

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Atlas Distribution Maps

Currently displayed: Atlas no. 109

White-winged Black Tern

Chlidonias leucopterus



© Karen Bartrop

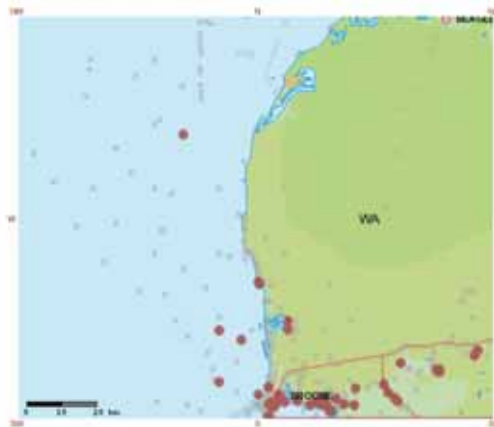
Filter records by month:

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Atlas Bird Lists

To obtain a general birdlist for an area, select the "get list" map tool and click a place on the map. The list for that area will appear in a new window. More accurate custom birdlists are also [available](#).

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Reporting Rates

Survey Effort

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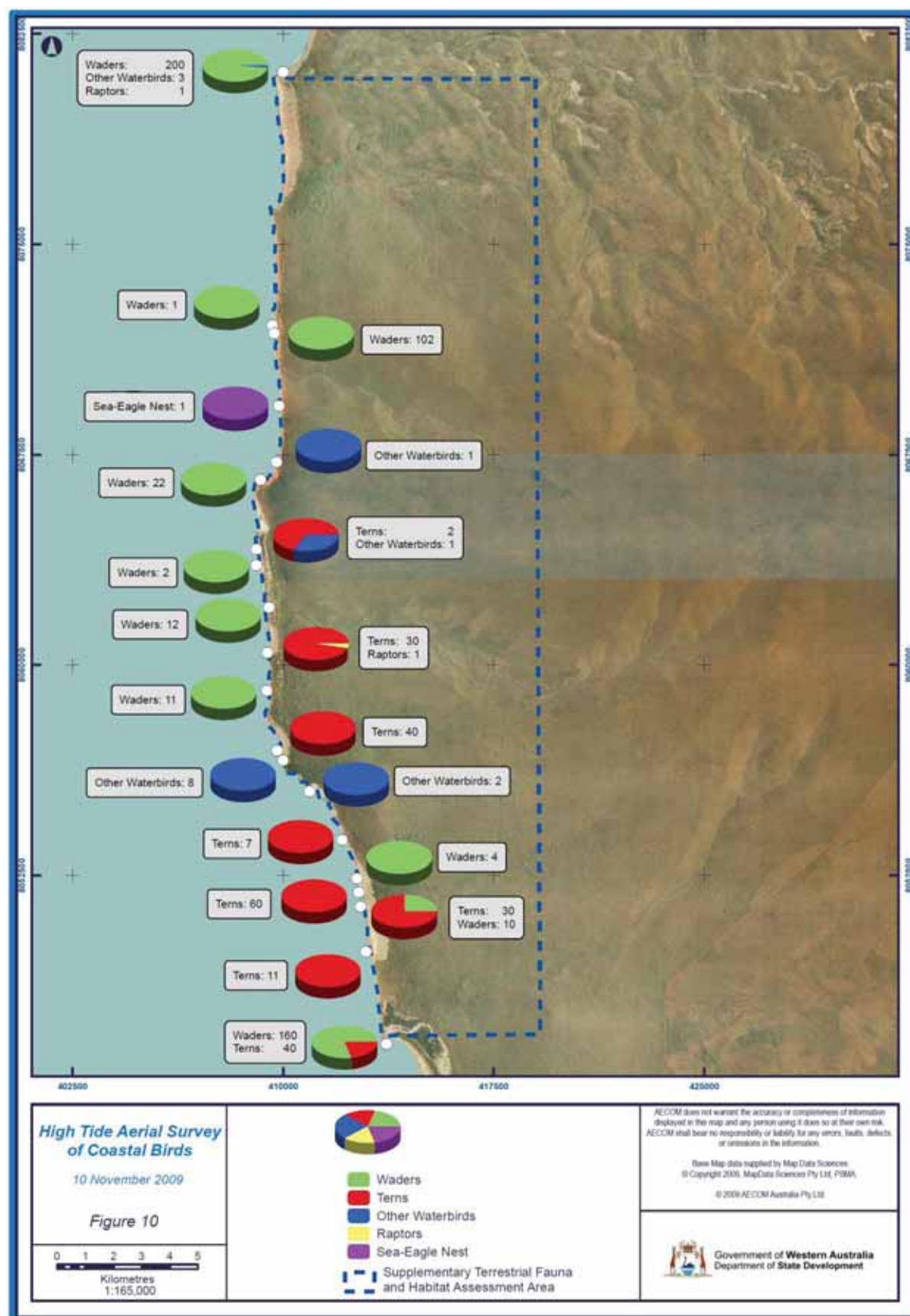
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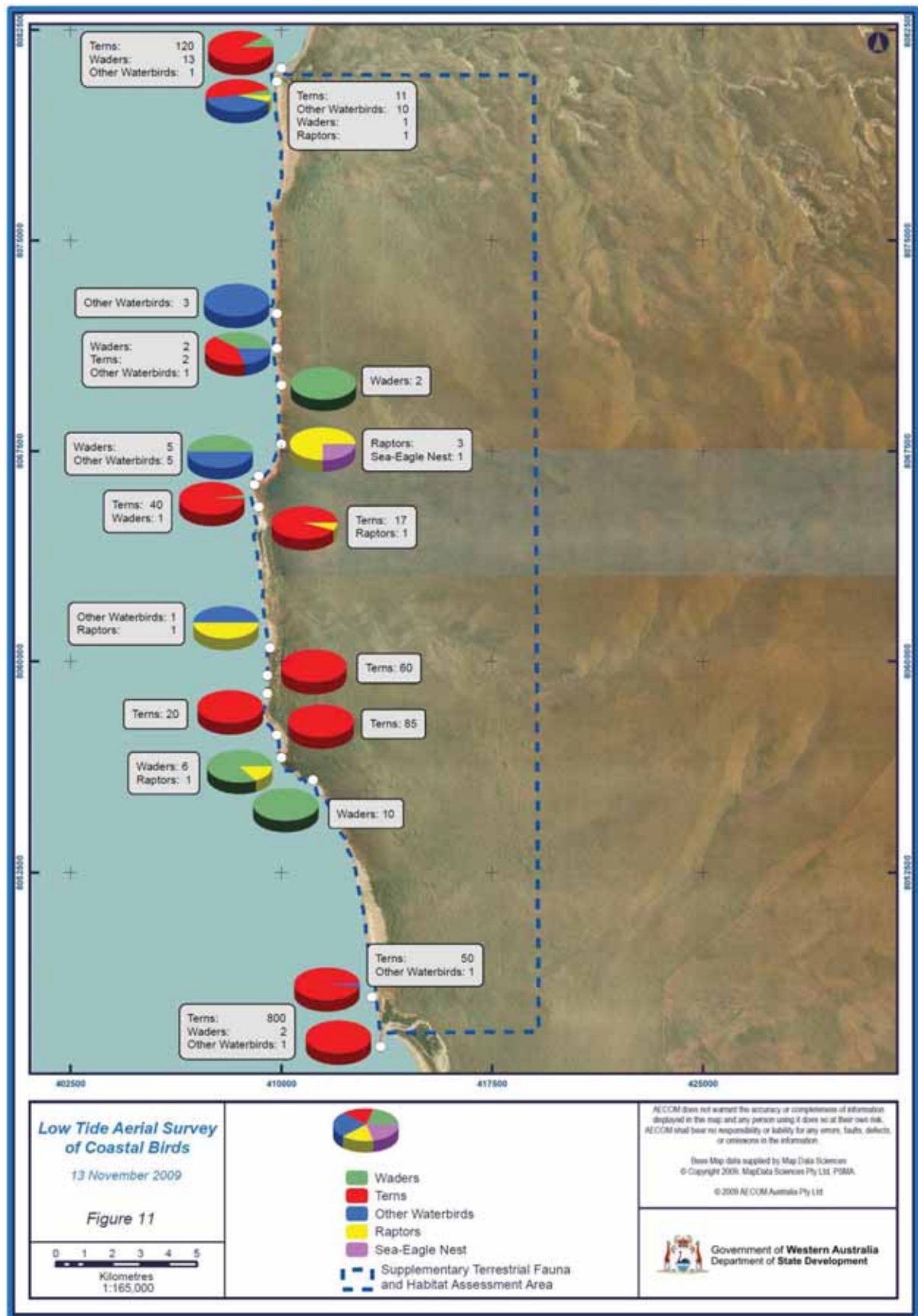


Appendix F: High and Low Tide Aerial Surveys of Coastal Birds, James Price Point, November 2009

Source: DSD (2010)







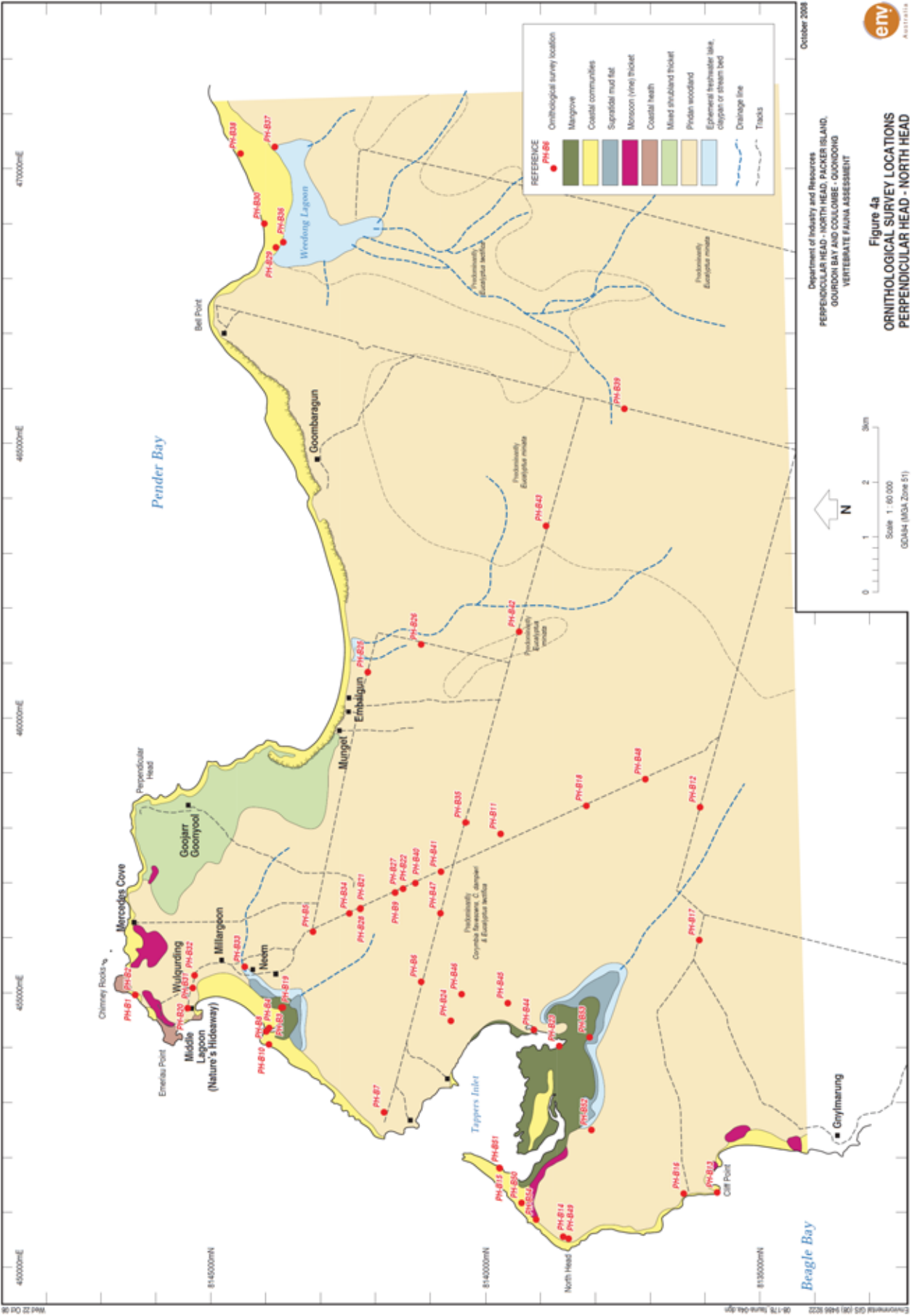
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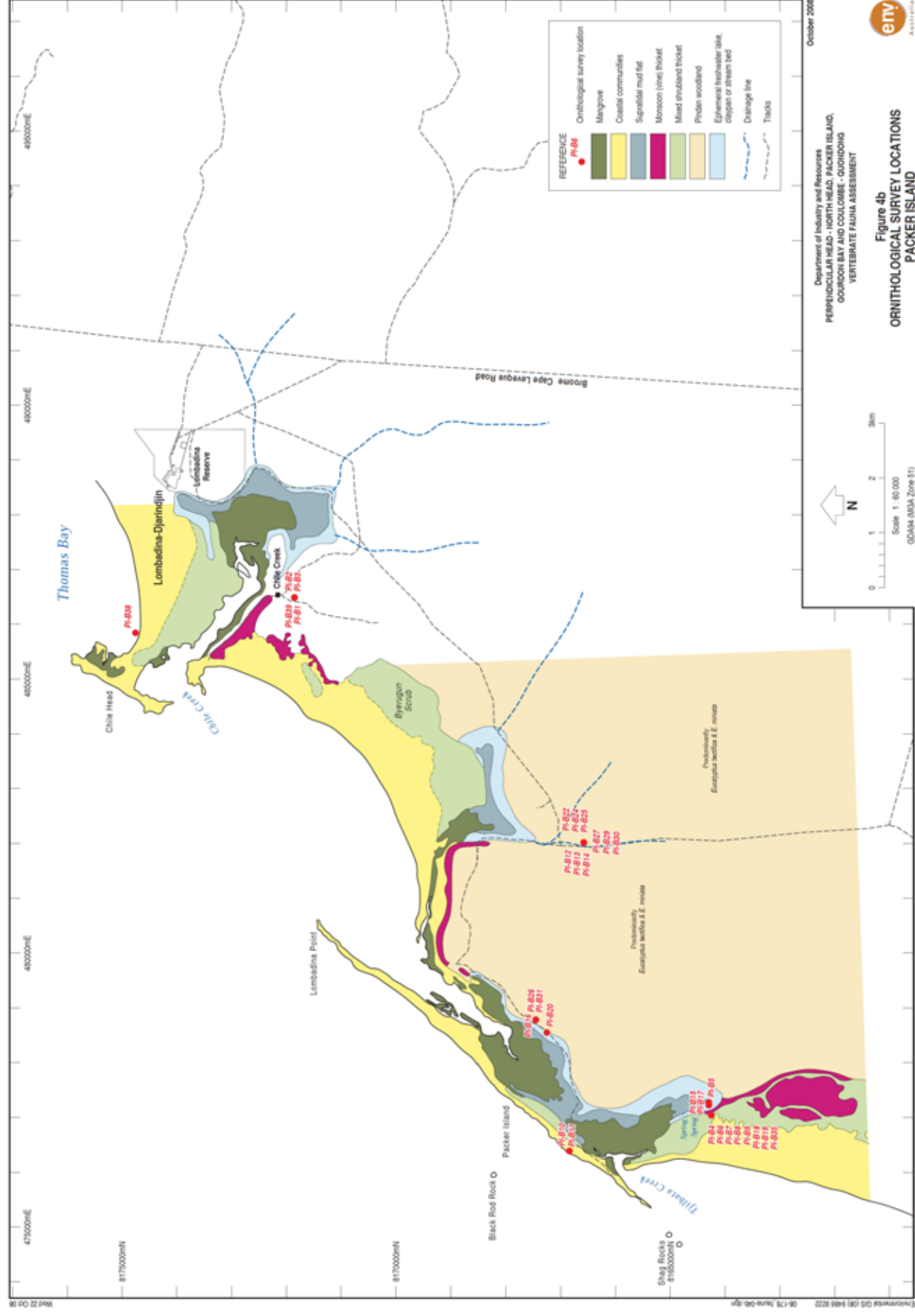


Appendix G: Habitat Maps - Perpendicular Head-North Head, Packer Island

Source: ENV Australia (2008a)







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