

APPENDIX 3: MNES SCREENING ASSESSMENT

1. Screening Assessment Approach

This document describes the process and results of the screening assessment that was undertaken to determine which of the threatened species and communities and listed migratory species (Controlling Provisions of the Proposal) were considered to be significantly impacted by the Proposal.

BHP Billiton Iron Ore conducted this screening assessment using the Commonwealth Department of the Environment matters of national environmental significance (MNES) Significant Impact Guidelines (DotE 2013). The screening assessment considered the ecology, habitat preference and other factors relevant to the MNES in relation to how they might be impacted by the Proposal. If the assessment determined that the risk of significant impact was low, then that species or ecological community was not considered a Specified Protected Matter for assessment in the Draft Impact Assessment Report (IAR).

The steps undertaken for screening assessment are shown in Figure 1 and described below.

Step 1: Covered by the Strategic Assessment (the Proposal)

The Protected Matters Search Tool (PMST) was reviewed initially to remove species or ecological communities that were not relevant to the Proposal. For example, no threatened ecological communities are located within the Strategic Assessment Area. Also, as the Proposal is terrestrial, marine mammals were not considered further in the screening assessment.

Step 2: Geographic location and distribution

The PMST distribution maps were reviewed to determine whether a significant proportion of the species distribution was located within or restricted the Strategic Assessment Area. The availability of habitats for fauna species potentially occurring within the Strategic Assessment Area was assessed based on fauna habitat and vegetation communities within BHP Billiton Iron Ore tenure (Onshore Environmental 2014; Biologic 2014), as well as publicly available literature and data sources for the Pilbara region. A key input was publicly available data from NatureMap, which is a Western Australian fauna and flora database maintained by the Department of Parks and Wildlife (DPaW).

Step 3: Significance of potential impact

A literature review was undertaken to determine the key characteristics and ecology of each species. In addition to the MNES Significant Impact Guidelines 1.1 (DotE 2013), species recovery plans, conservation advices and threat abatement plans were also reviewed.

The following was considered in determining the potential for each MNES to be sensitive to impacts associated with the Proposal. Habitat availability within the Strategic Assessment Area and individual species' ecological requirements and likelihood of presence Potential impacts such as habitat disturbance and the ecohydrological change assessment (BHP Billiton Iron Ore 2015) were considered. Examples of species screened out include the northern marsupial mole (*Notoryctes caurinus*), the night parrot (*Pezoporus occidentalis*) and all migratory species because impacts to these species from the Proposal were not considered to be significant, in line with the Significant Impact Guidelines 1.1 (DotE 2013).

Species that were potentially subject to significant impacts from the Proposal were considered to be Specified Protected Matters and thereby subject to comprehensive assessment in the Draft IAR. The outcomes of each step in the screening assessment are detailed in the following sections.

Subject to the endorsement of the MNES Program, any future actions or class of actions undertaken under the MNES Program will need to validate the currency of information on relevant Specified Protected Matters, including species recovery plans, conservation advices and threat abatement plans. As knowledge regarding Specified Protected Matters changes over time, BHP Billiton Iron Ore will modify its management response accordingly.

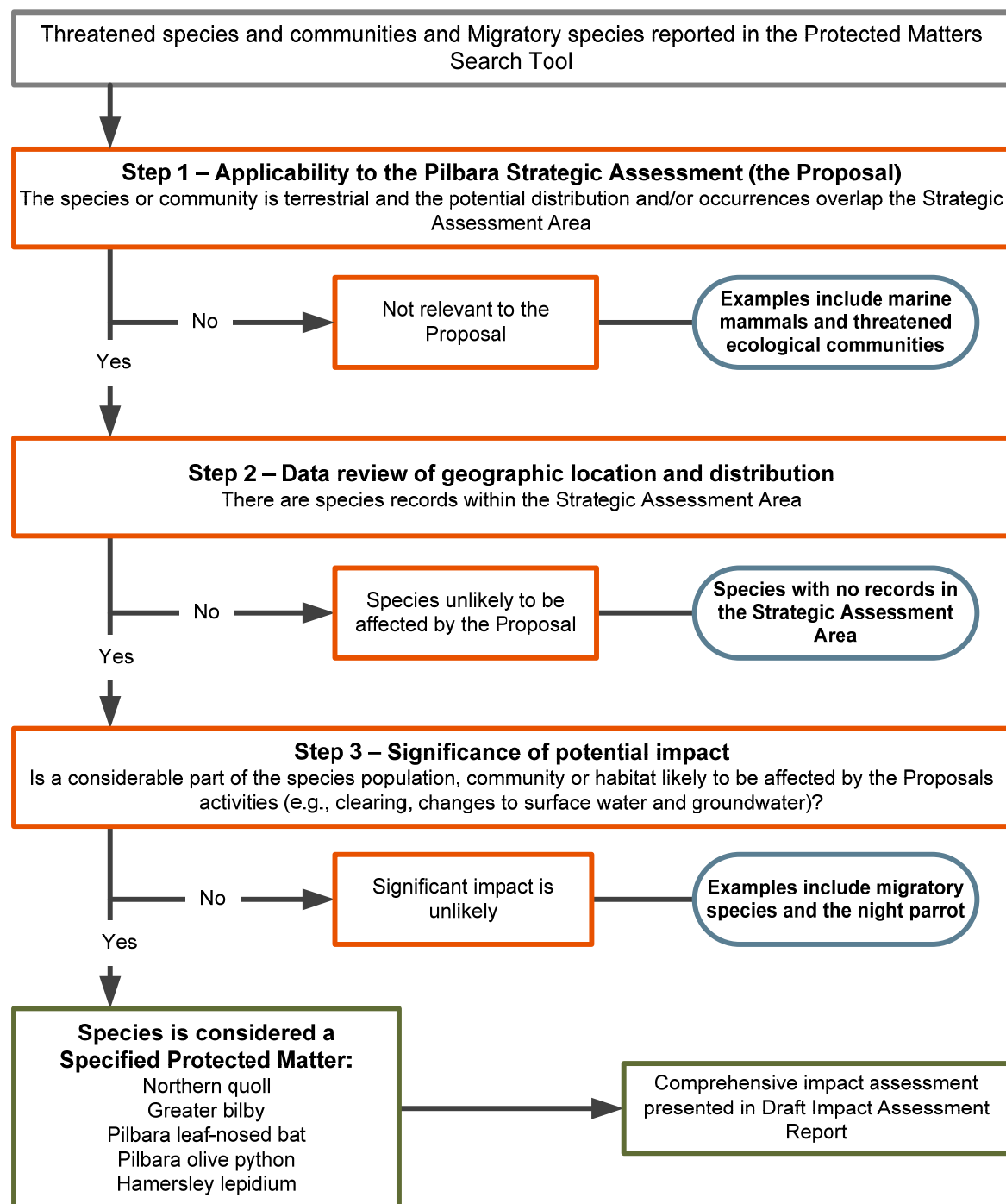


Figure 1: Process for the screening assessment

2. Step 1: Applicability to the Pilbara Strategic Assessment (the Proposal)

The PMST is based on the modelled distribution of species (rather than individual records of capture or sighting); therefore, the search results are only indicative that a species is present in a search area. The full PMST report is provided in Attachment A. All species that were considered unlikely to occur within the Strategic Assessment Area were not considered further in the screening assessment. For example, aquatic marine fauna and a species of skink, the Airlie Island ctenotus (*Ctenotus angusticeps*), were returned in the PMST report. These were not considered further within the screening assessment, given that the scope of the Proposal and the associated impacts being terrestrial. Airlie Island is offshore, outside of the Strategic Assessment Area and the Airlie Island ctenotus occurs on the mainland between Onslow and Broome and is restricted to samphire areas in or near the intertidal zone.

Note that PMST report did not return any threatened ecological communities within or overlapping the Strategic Assessment Area and were not considered further within this screening assessment.

3. Step 2: Data review of geographic location and distribution

Table 1 presents the threatened and migratory species that were returned in the PMST report as likely to occur or rely on the habitat types within the Strategic Assessment Area, along with records of the species obtained from BHP Billiton Iron Ore and publicly available data obtained from the Western Australian Department of Parks and Wildlife in late 2015, and the Western Australian Museum and Birdlife Australia in early 2016.

Table 1: Potential and confirmed MNES species occurrence within the Strategic Assessment Area

Latin Name	Common Name	Records within Strategic Assessment Area ¹
Critically Endangered		
<i>Calidris ferruginea</i> ²	Curlew sandpiper	Yes
<i>Numenius madagascariensis</i> ²	Eastern curlew	No records
Endangered Species		
<i>Macronectes giganteus</i> ²	Southern giant-petrel	No records
<i>Pezoporus occidentalis</i>	Night parrot	Yes
<i>Rostratula australis</i> ²	Australian painted snipe	Yes
<i>Dasyurus hallucatus</i>	Northern quoll	Yes
<i>Notoryctes caurinus</i>	Northern marsupial mole	No records
Vulnerable Species		
<i>Lepidium catapycnon</i>	Hamersley lepidium	Yes
<i>Pityrodia augustensis</i>	Mount Augustus foxglove	No records

Latin Name	Common Name	Records within Strategic Assessment Area ¹
<i>Thryptomene wittweri</i>	Mountain thryptomene	Yes
<i>Liasis olivaceus barroni</i>	Pilbara olive python	Yes
<i>Liopholis kintorei</i>	Great desert skink	No records
<i>Petrogale lateralis</i> subsp. <i>lateralis</i>	Black-flanked rock-wallaby	Yes ³
<i>Polytelis alexandrae</i>	Princess parrot	Yes ³
<i>Macrotis lagotis</i>	Greater bilby	Yes
<i>Rhinonicteris aurantia</i>	Pilbara leaf-nosed bat	Yes
Migratory Species		
<i>Anas querquedula</i>	Garganey	Yes
<i>Apus pacificus</i>	Fork-tailed swift	Yes
<i>Ardea ibis</i>	Cattle egret	Yes
<i>Ardea modesta</i>	Eastern great egret	Yes
<i>Arenaria interpres</i>	Ruddy turnstone	No records
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	Yes
<i>Calidris alba</i>	Sanderling	No records
<i>Calidris canutus</i>	Red knot	No records
<i>Calidris melanotos</i>	Pectoral sandpiper	Yes
<i>Calidris ruficollis</i>	Red-necked stint	Yes
<i>Calidris subminuta</i>	Long-toed stint	Yes
<i>Calidris tenuirostris</i>	Great knot	No records
<i>Charadrius dubius</i>	Little ringed plover	Yes
<i>Charadrius leschenaultii</i>	Greater sand plover	No records
<i>Charadrius mongolus</i>	Lesser sand plover	No records
<i>Charadrius veredus</i>	Oriental plover or oriental dotterel	Yes
<i>Fregata ariel</i>	Lesser frigatebird	No records
<i>Gelochelidon nilotica</i>	Gull-billed tern	Yes
<i>Glareola maldivarum</i>	Oriental pratincole	Yes
<i>Heteroscelus brevipes</i>	Grey-tailed tattler	No records
<i>Hirundo rustica</i>	Barn swallow	Yes
<i>Hydroprogne caspia</i>	Caspian tern	No records

Latin Name	Common Name	Records within Strategic Assessment Area ¹
<i>Limicola falcinellus</i>	Broad-billed sandpiper	No records
<i>Limnodromus semipalmatus</i>	Asian dowitcher	No records
<i>Limosa lapponica</i>	Bar-tailed godwit	No records
<i>Limosa limosa</i>	Black-tailed godwit	Yes
<i>Merops ornatus</i>	Rainbow bee-eater	Yes
<i>Numenius minutus</i>	Little curlew	No records
<i>Numenius phaeopus</i>	Whimbrel	No records
<i>Pandion haliaetus</i>	Eastern osprey or osprey	Yes
<i>Phalaropus lobatus</i>	Red-necked phalarope	No records
<i>Philomachus pugnax</i>	Ruff	Yes
<i>Plegadis falcinellus</i>	Glossy ibis	Yes
<i>Pluvialis fulva</i>	Pacific golden plover	No records
<i>Pluvialis squatarola</i>	Grey plover	No records
<i>Puffinus pacificus</i>	Wedge-tailed shearwater	No records
<i>Sterna albifrons</i>	Little tern	Yes
<i>Sterna dougallii</i>	Roseate tern	No records
<i>Sula leucogaster</i>	Brown booby	No records
<i>Tringa glareola</i>	Wood sandpiper	Yes
<i>Tringa hypoleucos</i>	Common sandpiper	Yes
<i>Tringa nebularia</i>	Common greenshank	Yes
<i>Tringa stagnatilis</i>	Marsh sandpiper	Yes
<i>Tringa tetanus</i>	Common redshank	Yes
<i>Xenus cinereus</i>	Terek sandpiper	No records

Notes:

1. Physical records are from publicly available data from Department of Parks and Wildlife, Birdlife Australia, and Western Australian Museum obtained in December 2015 and January 2016 and current BHP Billiton Iron Ore data. Some EPBC-Act threatened or migratory species that were not returned in the PMST (Attachment A) have been included.

2. Also listed as marine and migratory under the EPBC Act.

3. These records were considered by BHP Billiton Iron Ore to be erroneous and were not considered further within this document.

Species that have been recorded within the Strategic Assessment Area (as noted in the Table 1) were considered in Step 3 of the screening assessment and are discussed below. Those species with no records within the Strategic Assessment Area were not considered further.

4. Step 3: Significance of potential Impact

Significance of potential impacts to listed threatened species and listed migratory species are described in Sections 4.1 and 4.2.

4.1 LISTED THREATENED SPECIES

The Commonwealth Significant Impact Guidelines 1.1 (DotE 2013) provides criteria to assist determining whether an action is likely to have a significant impact on a threatened species. The significant impact criteria are provided in Table 2.

Table 2: DotE significant impact criteria for Critically Endangered, Endangered and Vulnerable species

Category	Significant Impact Criteria
Critically Endangered and Endangered Species	<p>An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will result in:</p> <ul style="list-style-type: none">• long-term decrease in the size of a population;• reduction in the area of occupancy of the species;• fragmentation of an existing population into two or more populations;• adverse effects on habitat critical to species survival;• disruption of the breeding cycle of a population;• modification, destruction, removal or isolation of or decrease in the availability or quality of habitat to the extent that the species is likely to decline;• establishment of invasive species that are harmful to the critically endangered species in its habitat;• introduction of disease that may cause the species to decline; or• interference with the recovery of the species.
Vulnerable Species	<p>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will result in:</p> <ul style="list-style-type: none">• long-term decrease in the size of an important population;• reduction in the area of occupancy of an important population;• fragmentation of an existing important population into two or more populations;• adverse effects on habitat critical to species survival;• disruption of the breeding cycle of an important population;• modification, destruction, removal or isolation of or decrease in the availability or quality of habitat to the extent that the species is likely to decline;• establishment of invasive species that are harmful to the species in the vulnerable species' habitat;• introduction of disease that may cause the species to decline; or• substantial interference with the recovery of the species.

Source: DotE (2013)

As provided in Table 1, there were 9 listed threatened species (critically endangered species, endangered species and vulnerable species) that had been recorded within the Strategic Assessment Area. The significance of potential impacts to those listed threatened species is discussed below.

CURLEW SANDPIPER (*CALIDRIS FERRUGINEA*)

The curlew sandpiper is currently listed as Critically Endangered and as a marine and a migratory species under the EPBC Act. Curlew sandpipers occur around Australian coasts and are also widespread inland, although erratically (DotE 2014) (Figure 2).

The species normally occurs on intertidal mudflats, lakes and lagoons in coastal areas, as well as on salt works and sewage farms; but when recorded inland they tend to be observed around ephemeral and permanent lakes, dams, waterholes and bore drains, typically with muddy or sandy edges. They will occur in both fresh and brackish water and are infrequently observed around floodwaters (Higgins & Davies 1996).

One curlew sandpiper individual was recorded in an avian fauna survey undertaken for BHP Billiton Iron Ore at Ophthalmia Dam in 2015 (MWH 2015). The species had been previously recorded inland by Birdlife Australia (2014), which until the MWH (2015) survey was the only inland record of the species in northwest Australia. MWH (2015) considered that the drainage area habitat of the Ophthalmia Dam survey study area might provide irregular habitat for the species at certain times of year, depending on water levels.

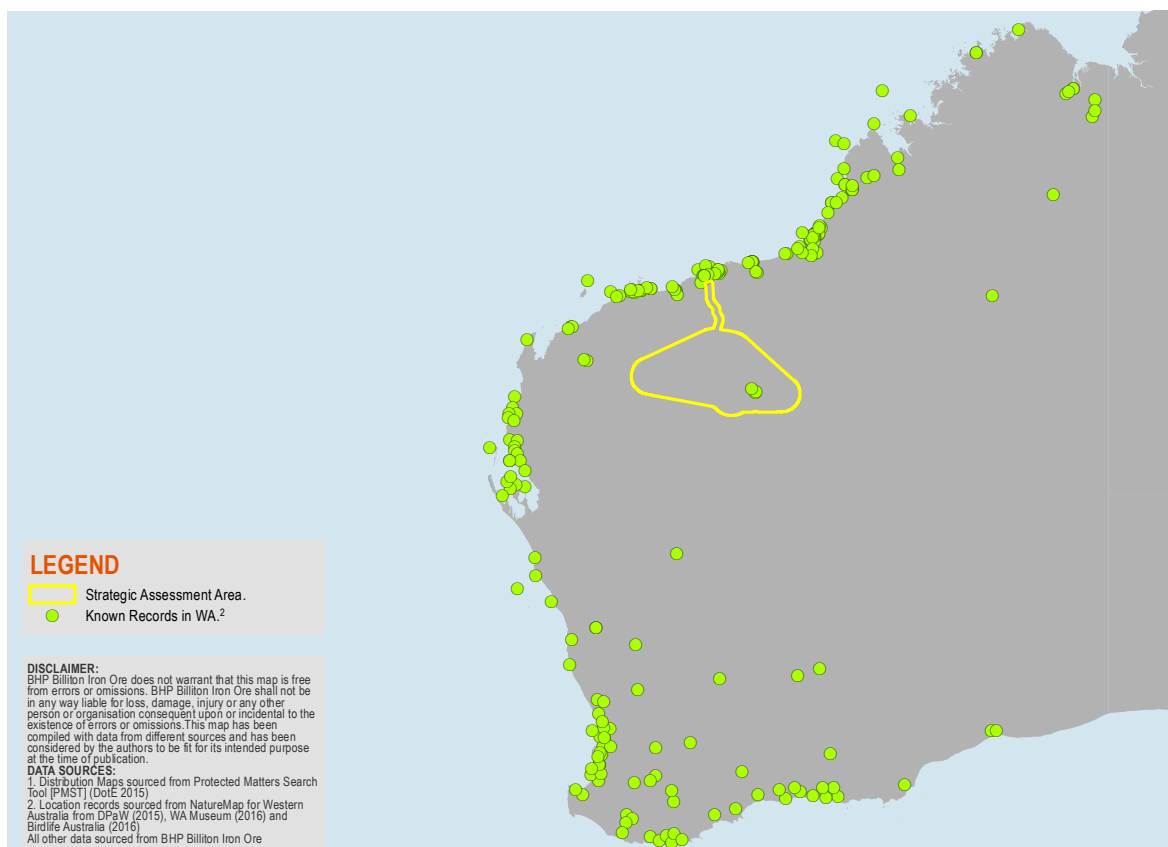
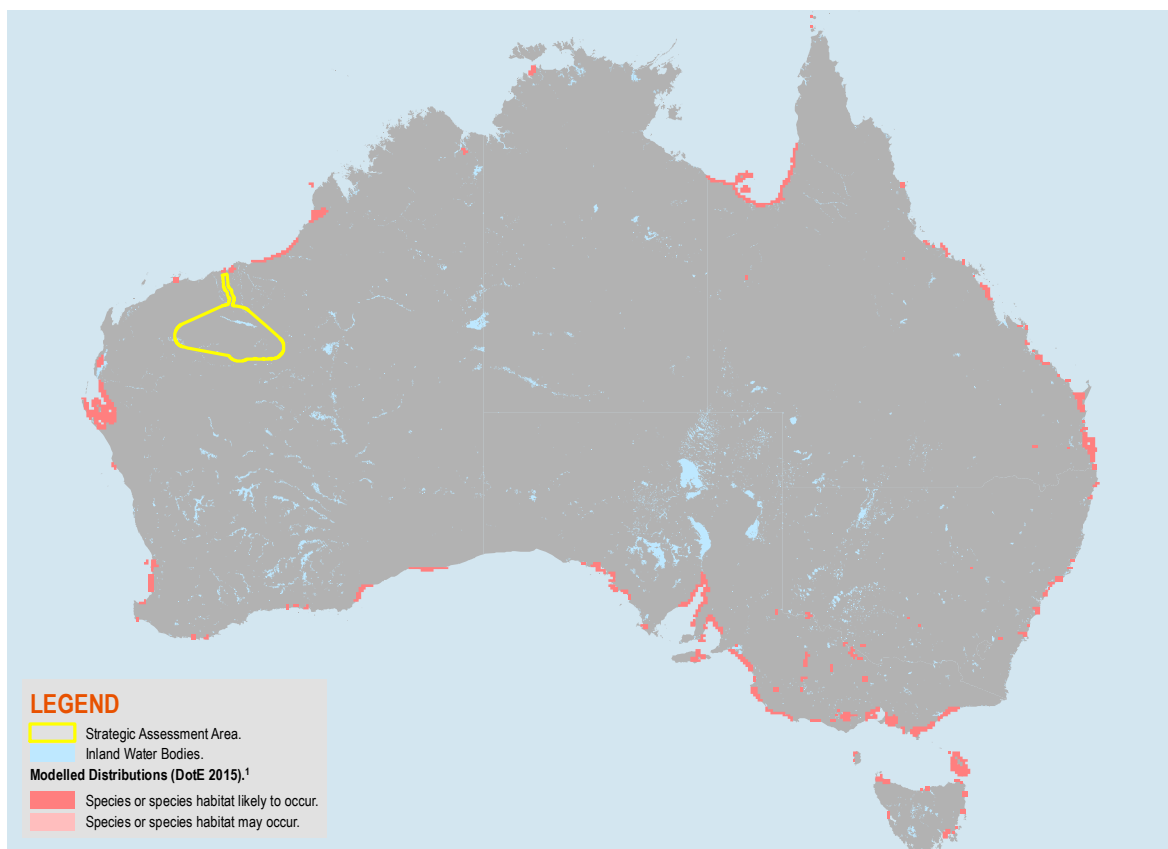
BHP Billiton Iron Ore considers that implementation of the Proposal is not likely to trigger any of the DotE's significant impact criteria set out in Table 2; this is because preferred and critical habitats for the species within the Pilbara are coastal, the latest inland record of the species is in habitat regarded as irregular (MWH 2015), and the accepted distribution of the species only overlaps with the Strategic Assessment Area on its northernmost boundary. The curlew sandpiper is not considered further in the Draft IAR.

NIGHT PARROT (*PEZOPORUS OCCIDENTALIS*)

The night parrot is listed as Endangered under the EPBC Act. There are few records throughout Australia since 1935 (Garnett et al. 2011). Figure 3 shows both confirmed and unverified records of the night parrot.

Historic evidence suggests the night parrot was distributed over much of semi-arid and arid Australia (Garnett & Crowley 2000). The species is extremely secretive and hard to flush, making it difficult to survey. The most recent documented sighting of the night parrot in Western Australia was in 2005, approximately 2 km north of the Fortescue Marsh (Davis & Metcalf 2008; Fortescue Metals Group 2005). There are three confirmed records of the night parrot in the Pilbara bioregion (DotE 2014). These three records are within the Strategic Assessment Area but outside the Proposal tenure.

The preferred habitat of the species is thought to comprise dense, low vegetation usually associated with *Triodia* grasslands and occasionally chenopod shrubland. Sources of water are also considered important to the species (North 1898; Whitlock 1924; Wilson 1937; McGilp 1931; Johnstone & Storr 1998). It is considered to be very rare, even in its preferred habitat of spinifex plains or among samphire bushes on the margins of salt lakes (Morcombe 2010). Given on the paucity of records to date, the probability of night parrots occurring within the Strategic Assessment Area is difficult to estimate, even in areas where potential habitat exists. In the approximately 135 vertebrate fauna surveys undertaken by BHP Billiton Iron Ore in the Pilbara, the night parrot has never been identified.



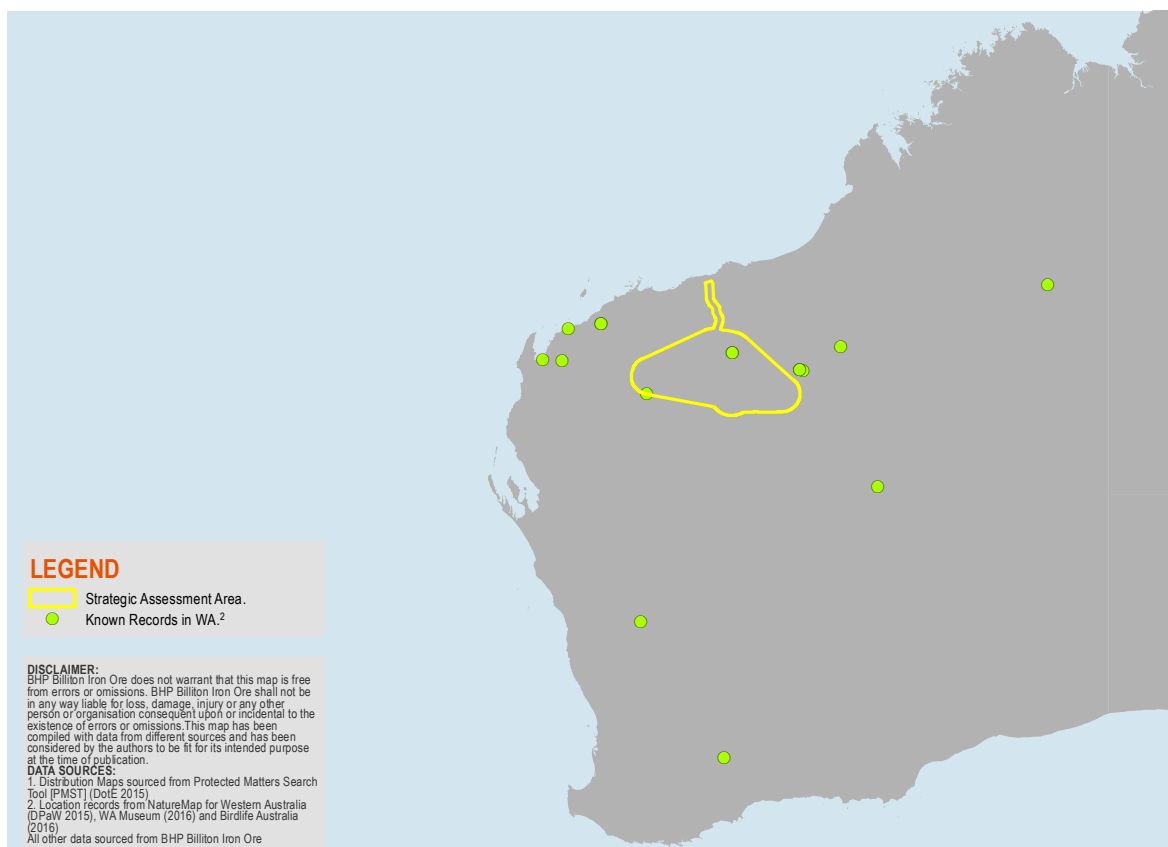
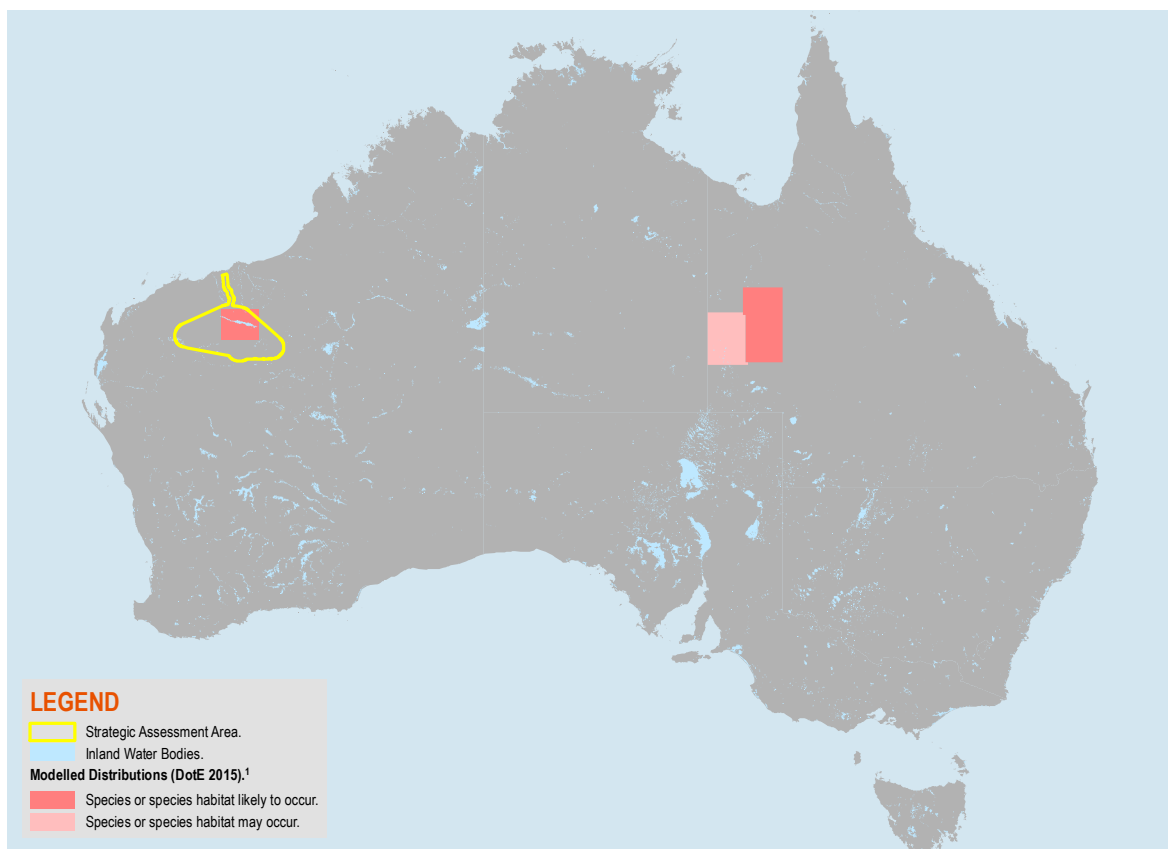
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Figure 2 Curlew sandpiper distribution relative to the Strategic Assessment Area

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Figure 3 Night parrot distribution relative to the Strategic Assessment Area

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Confirmed records and apparent habitat preference indicate that primary habitat for the night parrot is likely to be the spinifex and samphire habitat of the Fortescue Marsh (Bamford & Turpin 2010). Implementation of the Proposal will not directly impact on this habitat. Further, an assessment of potential ecohydrological change for the Fortescue Marsh has indicated that cumulative groundwater drawdown from the Proposal and third-party mining operations will affect approximately 1% of the marsh area.

Predicted changes to ground and surface water availability as a result of implementation of the Proposal will not change ecosystem functioning of the marsh (BHP Billiton Iron Ore 2015). On this basis, BHP Billiton Iron Ore considers that the implementation of the Proposal will not trigger significant impact criteria (DotE 2013) for the night parrot, and the species is therefore not considered further in this Draft IAR.

AUSTRALIAN PAINTED SNIPE (*ROSTRATULA AUSTRALIS*)

The Australian painted snipe is currently listed as Endangered under the EPBC Act. Despite being recorded throughout much of Australia, the Australian painted snipe has a small area of occupancy of around 2,000 km² (Garnett et al. 2011). In the Pilbara, there are only a small number of records and these have typically been associated with artificial water bodies (Johnstone et al. 2013) and a billabong just south of the Fortescue Marsh (Knuckey et al. 2013). It has not yet been recorded breeding in the Pilbara bioregion and is considered an irregular visitor (Johnstone et al. 2013). Only one record of the Australian painted snipe is located in the Strategic Assessment Area at Fortescue Marsh (Figure 4).

Given the extent of its occurrence throughout Australia, it is not considered that any of the DotE's significant impact criteria (DotE 2013) would be triggered by the implementation of the Proposal. The Australian painted snipe is not considered further in the Draft IAR.

NORTHERN QUOLL (*DASYURUS HALLUCATUS*)

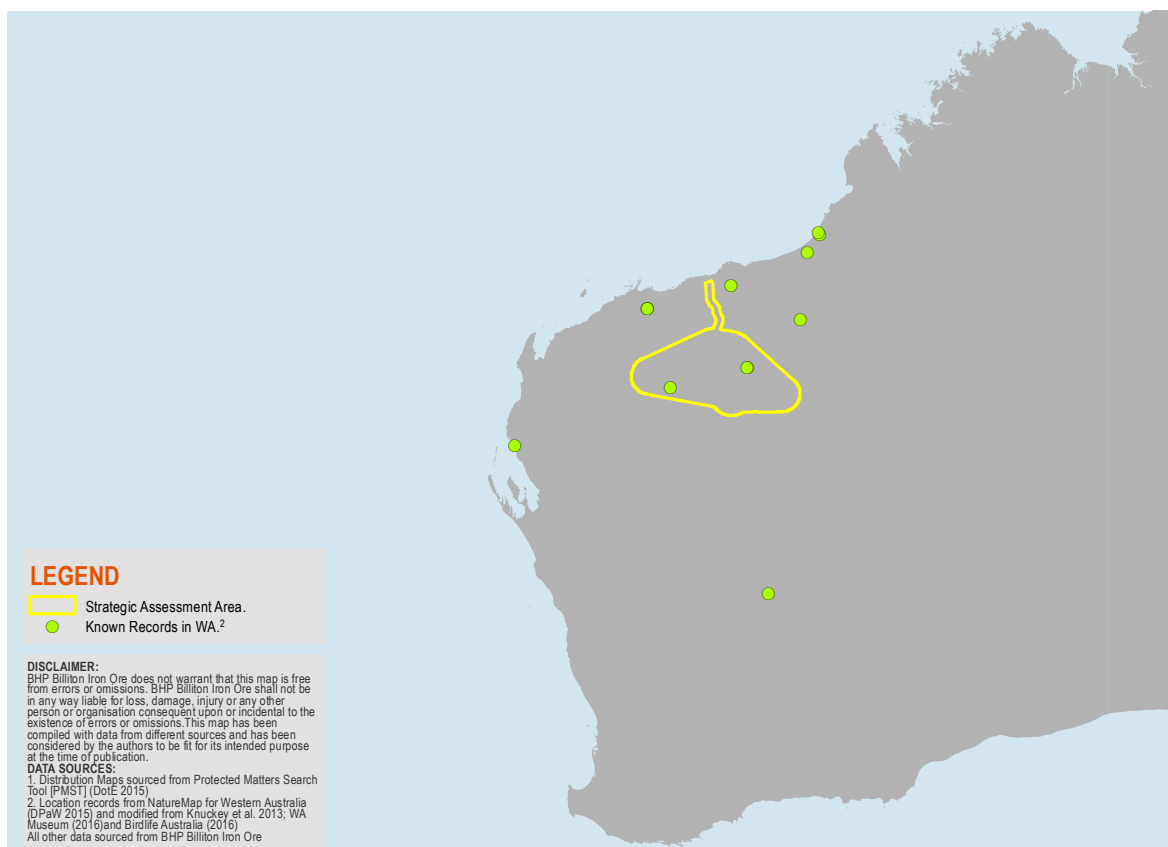
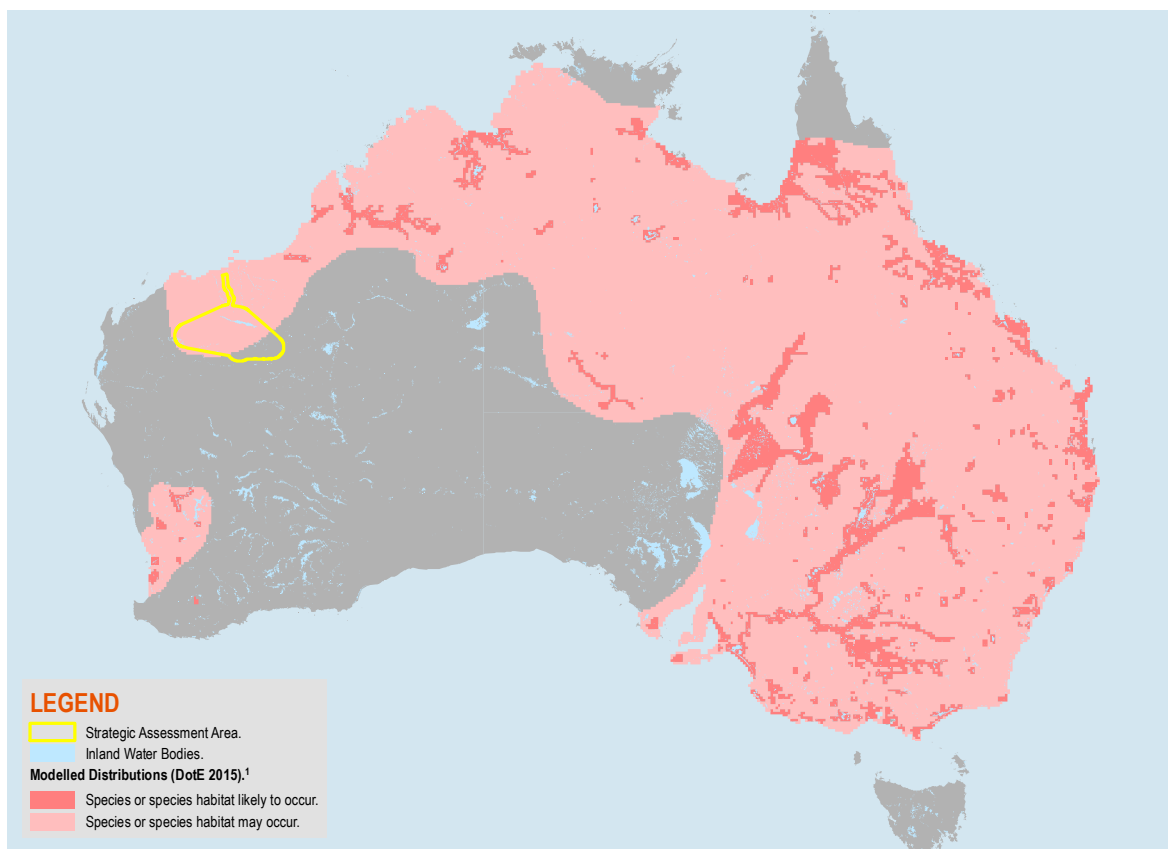
The northern quoll is listed as Endangered under the EPBC Act and as Schedule 1 (species considered rare or likely to become extinct) under the Western Australian Wildlife Conservation Act. The current distribution is discontinuous across northern Australia, restricted to six main areas, including the Pilbara, Kimberley, Northern Territory and Queensland (three centres) and a number of islands along the north and west coasts (DotE 2014; Hill & Ward 2010). In the Pilbara, the northern quoll's distribution is bounded in the north, east and south by the Great Sandy Desert, Gibson Desert and Little Sandy Desert (DotE 2014). The species distribution for the northern quoll is shown in Figure 5.

The northern quoll distribution overlaps significantly with the Strategic Assessment Area and many records are located within the northern parts of the Strategic Assessment Area. For this reason, the northern quoll is considered a Specified Protected Matter and has been subject to assessment in the Draft IAR.

HAMERSLEY LEPIDIUM (*LEPIDIUM CATAPYCNON*)

Hamersley lepidium is listed as Vulnerable under the EPBC Act and as Schedule 1 (threatened flora) under the WC Act.

The Hamersley lepidium is endemic to the Pilbara, occurring in scattered locations of the Hamersley Range (Brown et al. 1998) (Figure 6). The species is recorded from the Newman, Wittenoom, Weeli Wolli Creek and West Angelas areas (DotE 2014). The species is known from 230 records, some containing approximately 1,000 plants (Rio Tinto 2011). DotE (2014) reports 23 distinct populations of the species; however, recent work by Onshore Environmental (2014) has suggested that 2011 data



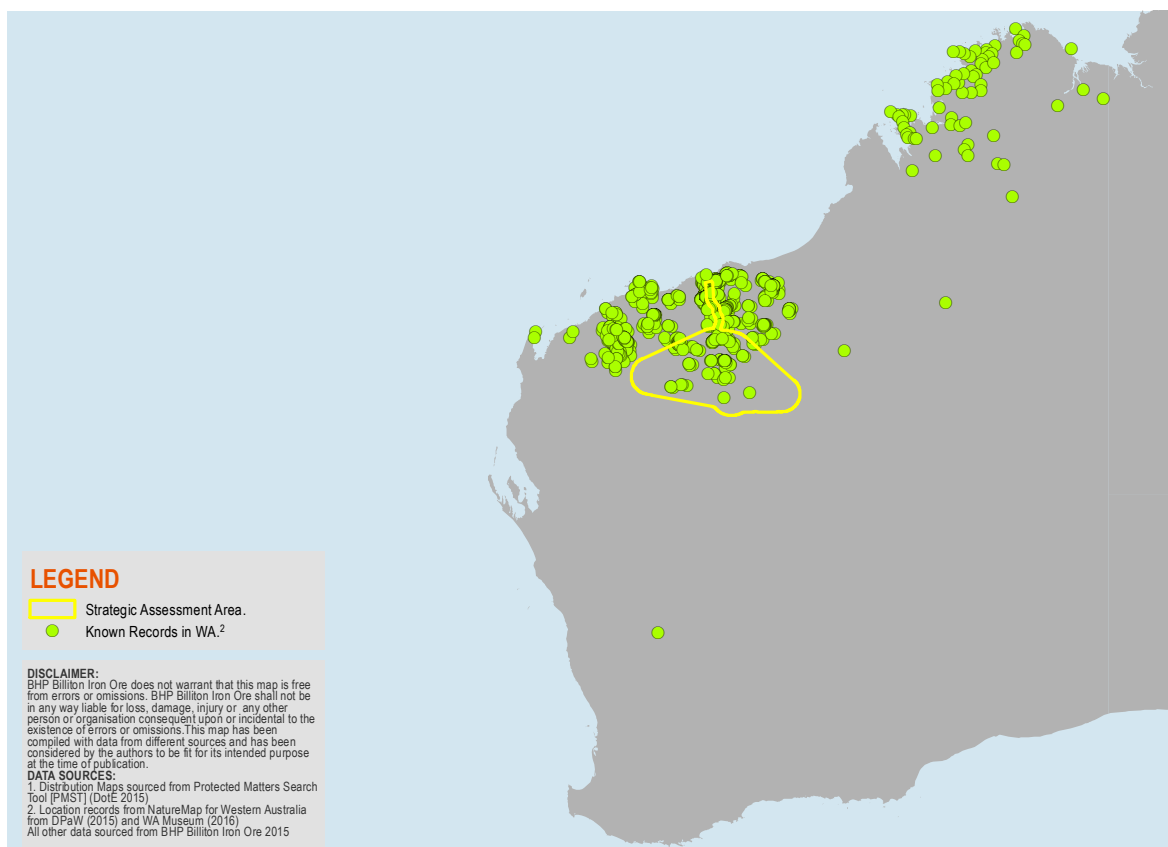
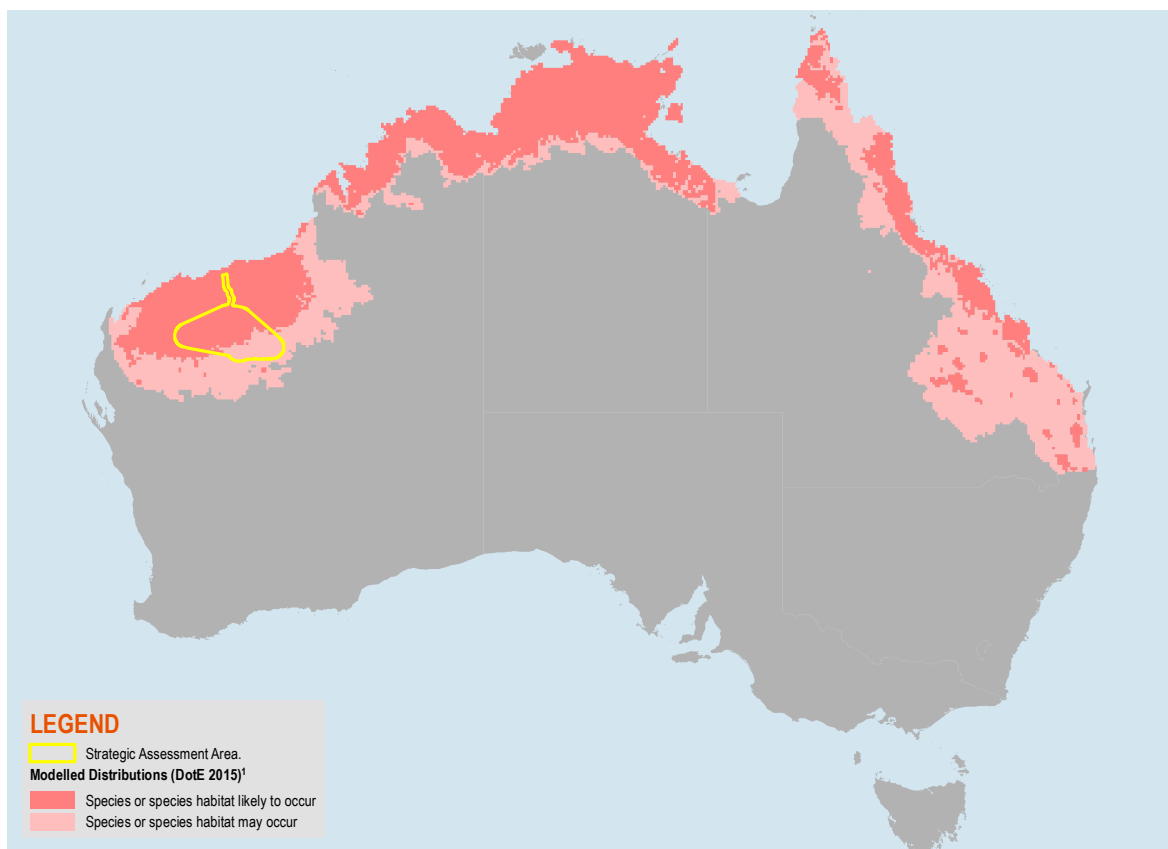
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Figure 4 Australian painted snipe distribution relative to the Strategic Assessment Area

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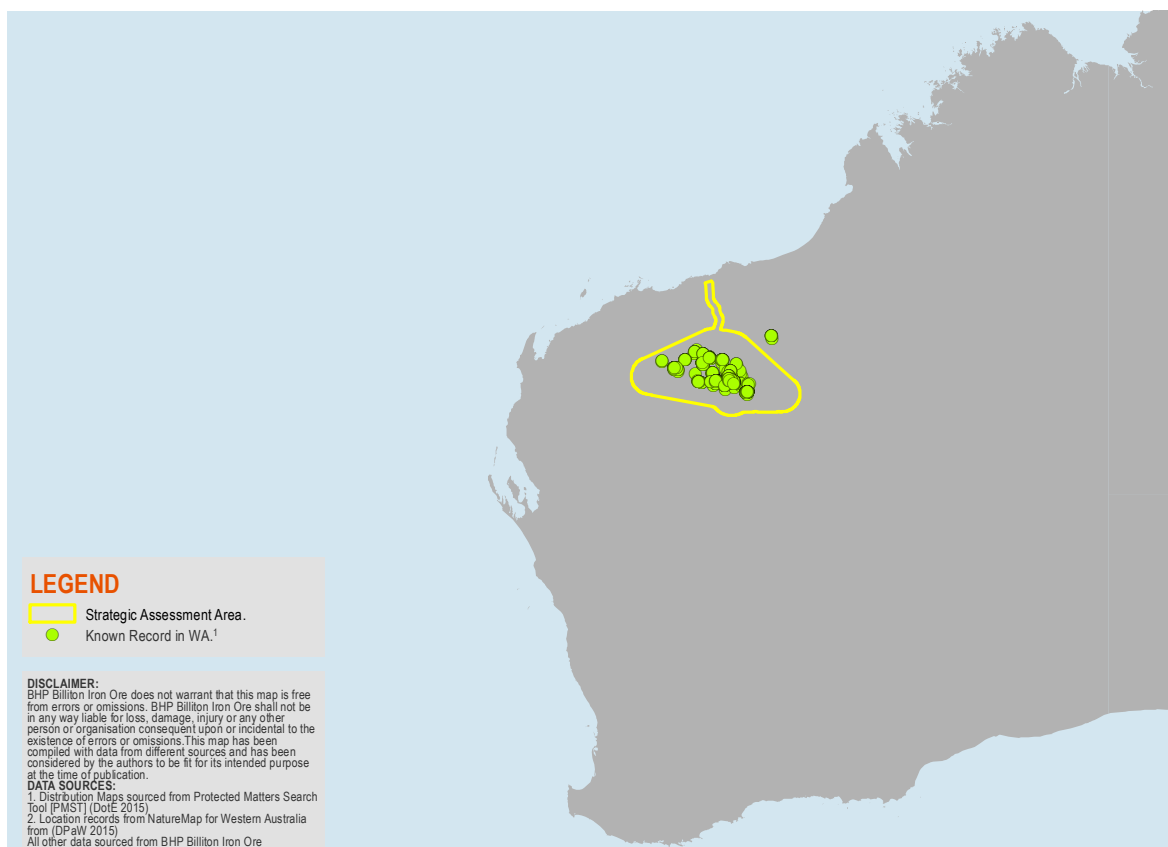
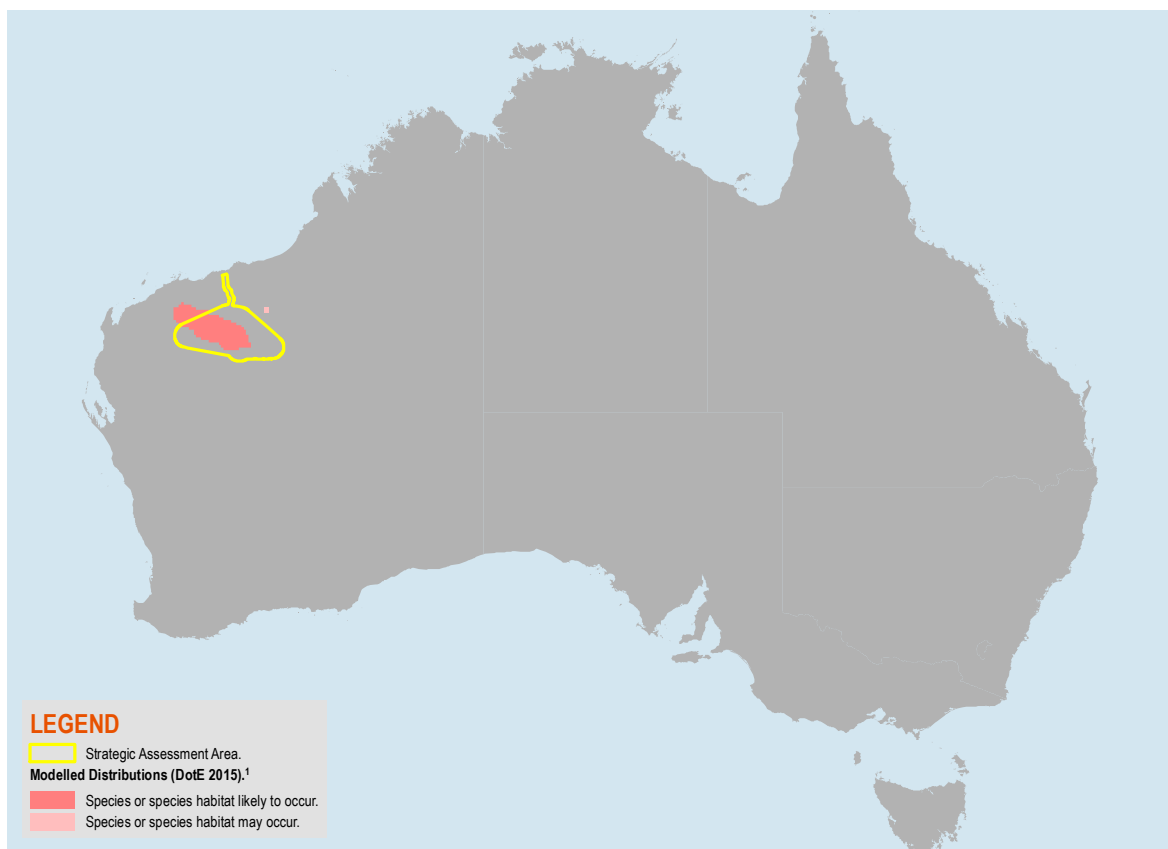
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Figure 5 Northern quoll distribution relative to the Strategic Assessment Area

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Figure 6 Hamersley lepidium distribution relative to the Strategic Assessment Area

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from a Department of Environment and Conservation database identifies a total of 32 populations. The populations recorded by Onshore Environmental in recent years represent a significant increase in the previously known distribution of this species. Onshore Environmental (2012) states that the species' distribution covers approximately 21,736 km² in an area stretching between the towns of Newman, Nullagine and Tom Price in the Pilbara.

Given the significant overlap of the Hamersley lepidium distribution and known records within the Strategic Assessment Area the species is considered a Specified Protected Matter and has been subject to comprehensive assessment in the Draft IAR.

MOUNTAIN THRYPTOMENE (*THRYPTOMENE WITTWERI*)

Mountain thryptomene is currently listed as Vulnerable under the EPBC Act. Populations of mountain thryptomene have been recorded at four broad locations, three of which are in Western Australia; the other is in the Northern Territory (DotE 2014). All records of mountain thryptomene from the Pilbara are present in high-altitude areas (Onshore Environmental 2013a). Based on broad qualitative criteria from sites of mountain thryptomene in Western Australia, the lowest recorded elevation required for the species is 910 m.

The portion of the Strategic Assessment Area above 900 m represents 1.1% of the Strategic Assessment Area, and the proportion within current BHP Billiton Iron Ore tenure is 0.06% of the total area of the Strategic Assessment Area. A more conservative approach using 800 m as the lower limit of habitat alters these figures to 3.5% of the Strategic Assessment Area being potential habitat, of which 0.24% is within current BHP Billiton Iron Ore tenure. Elevations within the Strategic Assessment Area are presented in Figure 7.

Assessment against EPBC Act criteria for Vulnerable species (Table 2) indicates that implementation of the Proposal is not likely to significantly impact mountain thryptomene. No effect on the species' breeding cycle is expected to occur. The mountain thryptomene is not considered further in the Draft IAR.

PILBARA OLIVE PYTHON (*LIAISIS OLIVACEUS BARRON*)

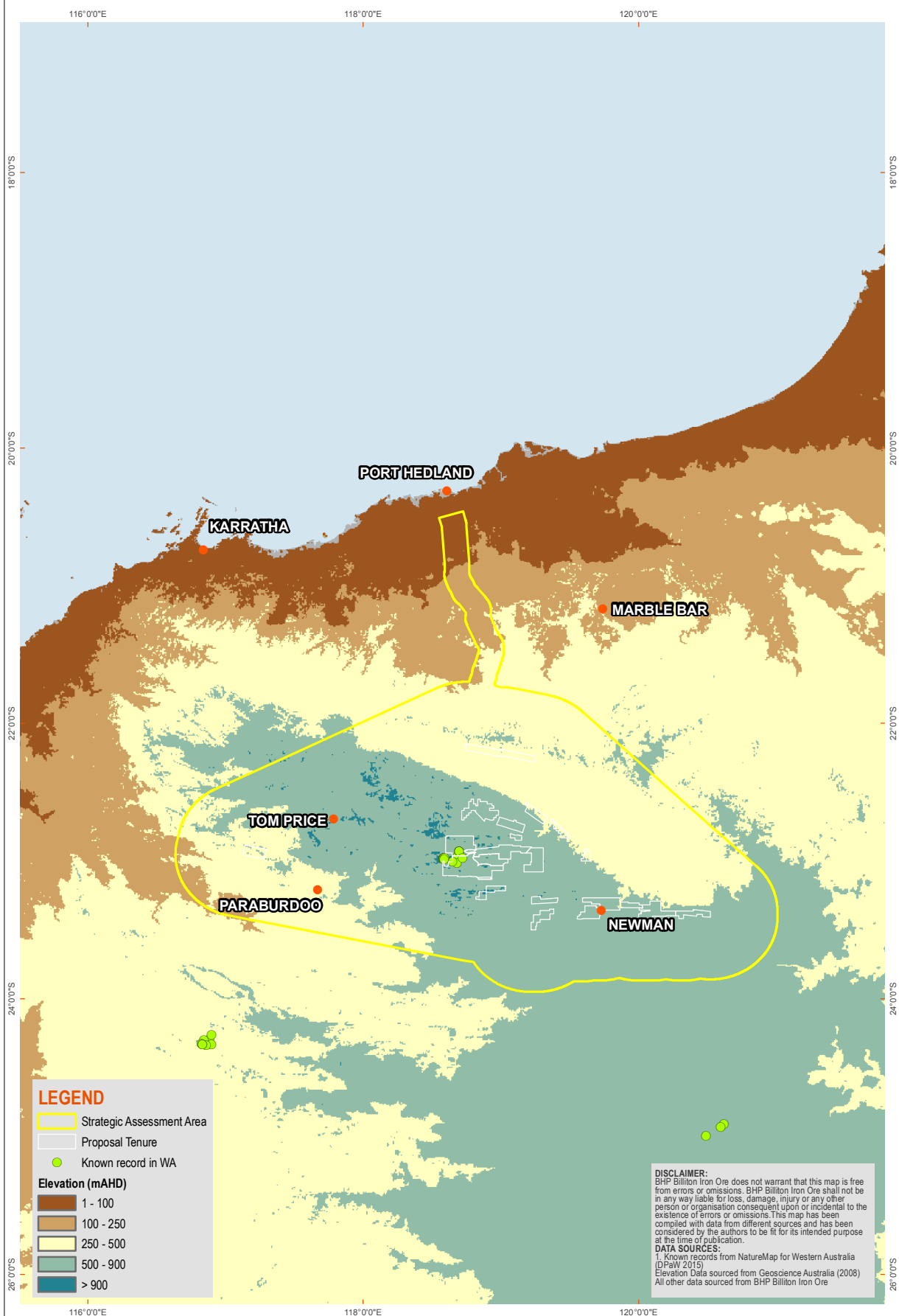
The Pilbara olive python is listed as Vulnerable under the EPBC Act and 'Schedule 1' under the WC Act. The python is described by the DotE (2014) as being restricted to ranges within the Pilbara bioregion; although an apparently isolated population occurs south on Mount Augustus in the Gascoyne bioregion (Bush & Maryan 2011) and additional records exist in the northeastern Carnarvon bioregion). Within the Pilbara bioregion, the species has been recorded from the Hamersley Range, Dampier Archipelago, Pannawonica, Millstream, Tom Price, Burrup Peninsula, and 70 km east of Port Hedland (DotE 2014). The species is also known from riparian areas along the Fortescue River (Doughty et al. 2011). The species distribution for the Pilbara olive python is shown in Figure 8.

Given the significant overlap of the Pilbara olive python distribution and known records within the Strategic Assessment Area, the species is considered a Specified Protected Matter and has been subject to comprehensive assessment in the Draft IAR.

GREATER BILBY (*MACROTIS LAGOTIS*)

The greater bilby is listed as Vulnerable under the EPBC Act and 'Schedule 1' under the WC Act.

The greater bilby once occurred across most of the arid and semi-arid regions of the Australian mainland, south of about latitude 18°S (Johnson 2008; Friend et al. 2008). The greater bilby's range has significantly contracted since European settlement, and it now remains patchily distributed through the Tanami Desert in the Northern Territory and west to Broome and south to Warburton in Western Australia.



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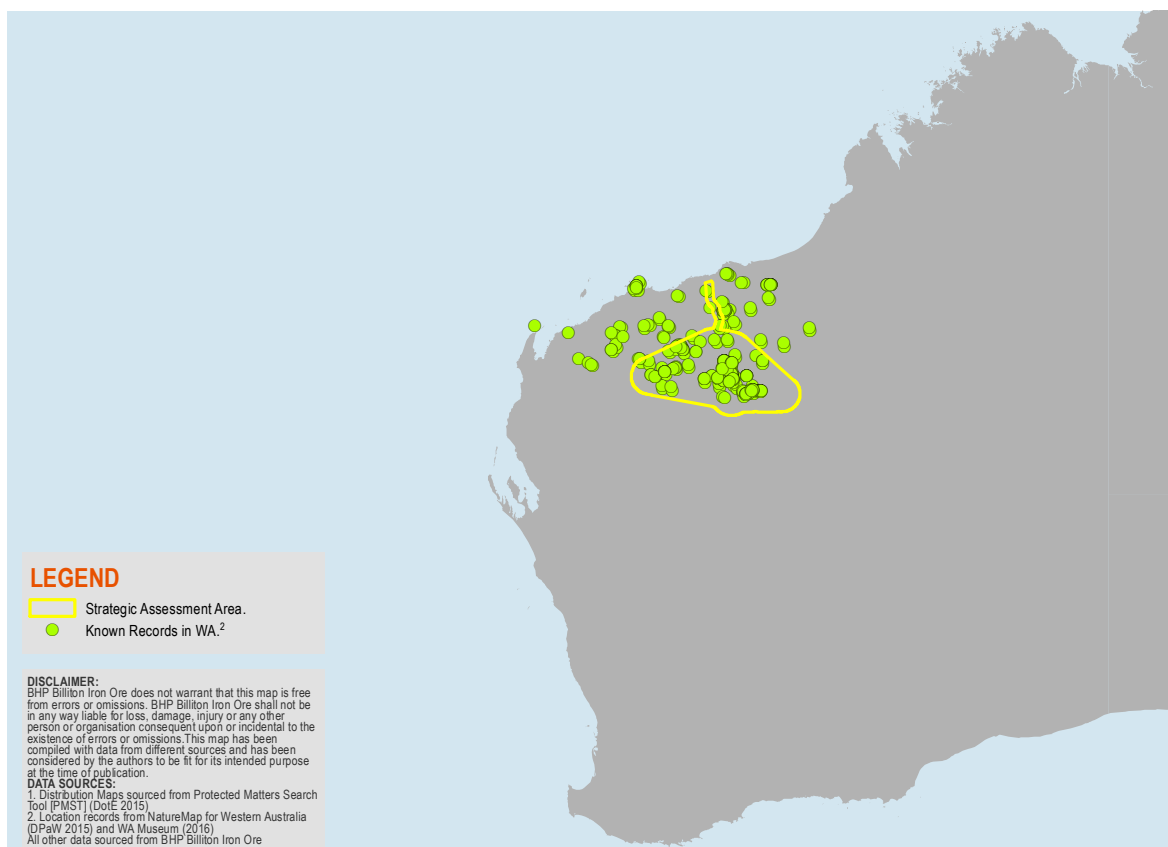
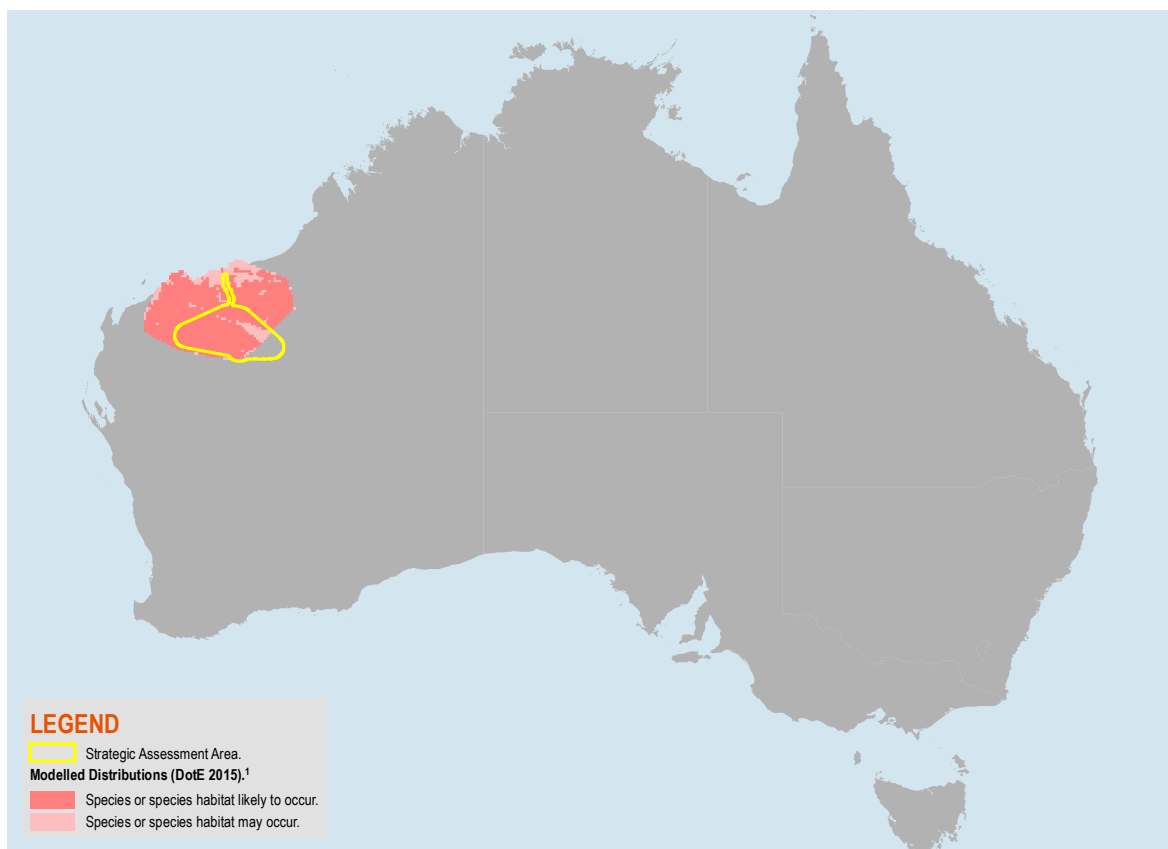
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Figure 7 Mountain thryptomene distribution relative to the Strategic Assessment Area and elevation

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Figure 8 Pilbara olive python distribution relative to the Strategic Assessment Area

DATE: 16/03/2016
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There are isolated populations north of Birdsville in southwestern Queensland and northeast of Alice Springs in the Northern Territory (Johnson 2008). The species distribution for the greater bilby is shown in Figure 15.

Given that there are many records of the greater bilby within the Strategic Assessment Area, particularly along the rail corridor, this species is considered a Specified Protected matters and has and has been subject to comprehensive assessment in the Draft IAR.

PILBARA LEAF-NOSED BAT (*RHINONICTERIS AURANTIA*)

The Pilbara leaf-nosed bat is listed as Vulnerable under the EPBC Act and 'Schedule 1' under the WC Act. The Pilbara leaf-nosed bat occurs over an approximate area of 120 million hectares (Eco Logical 2015) and is restricted to the Pilbara region of Western Australia (DotE 2014). Armstrong (2001) suggests that there may be three discrete subpopulations – George Range, Hamersley Range and Upper Gascoyne – separated by extensive flat areas restricting gene flow. The subpopulations can be further separated into individual colonies, which vary in size from 10 individuals to 20,000 individuals, although the latter is exceptional (e.g. Armstrong 2001; Ecologia Environment 2005, 2006a, 2006b). The total number of Pilbara leaf-nosed bats is currently unknown due to difficulties in counting individuals (Eco Logical 2015). An assessment of data by Bullen (2013) indicates 24 maternal or day roosts occur across the Pilbara, many of which are not identified by the DotE (2014). The species distribution for the Pilbara leaf-nosed bat is shown in Figure 16.

Given the significant overlap of the Pilbara leaf-nosed Bat distribution and known records within the Strategic Assessment Area, this species is considered a Specified Protected Matter and has been subject to comprehensive assessment in the Draft IAR.

LISTED MIGRATORY SPECIES

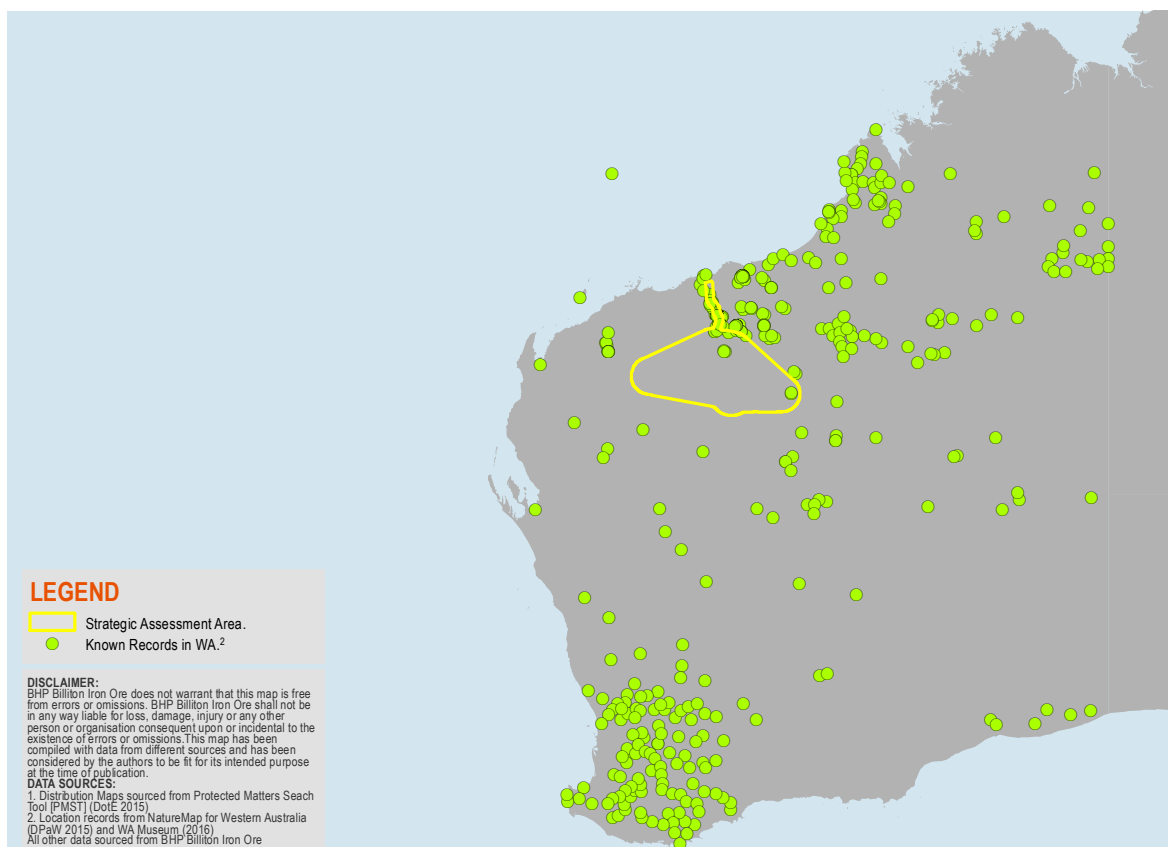
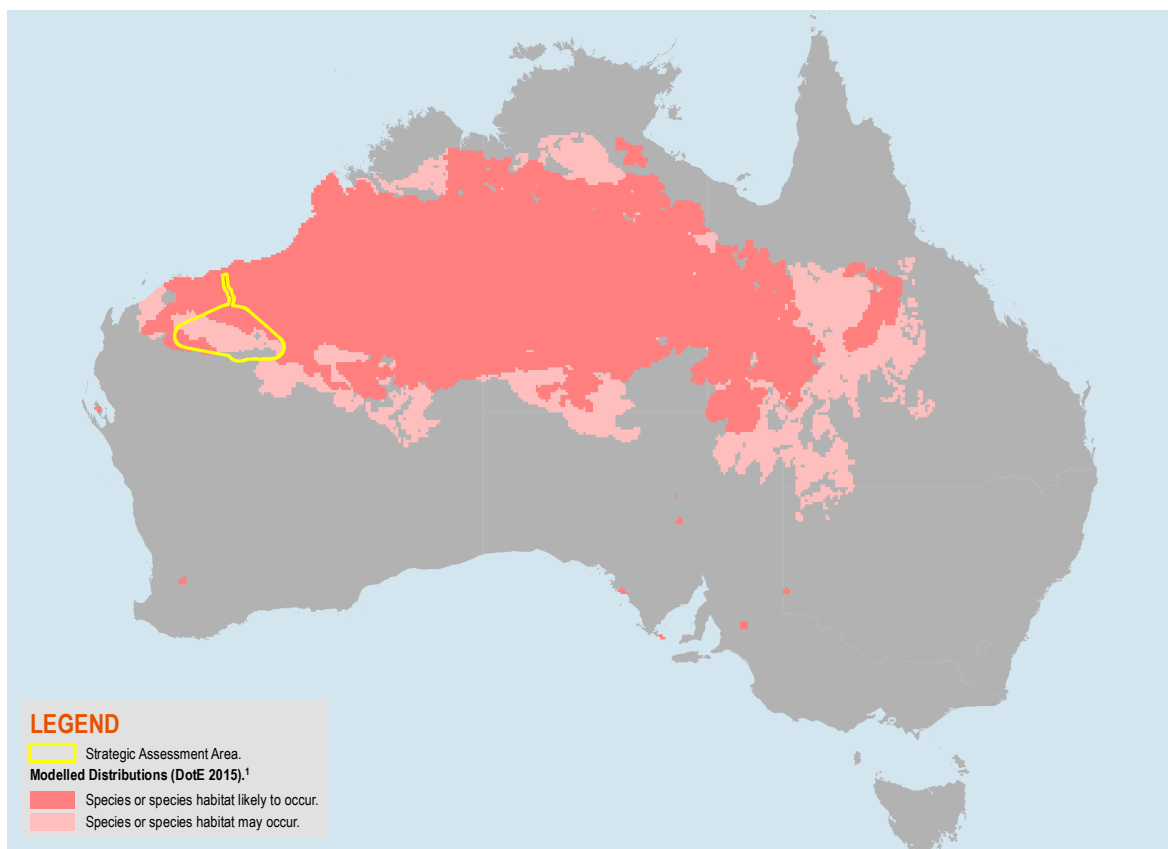
There was a total of 25 listed migratory species returned in the PMST and which have been recorded within the Strategic Assessment Area (Table 1). These species are discussed in this section. Some species that are listed as migratory species are also listed as threatened under the EPBC Act (Table 1); these species are discussed in Section 4.1.

To assess whether the Proposal is likely to have a significant impact on listed migratory species, the following DotE (2013) criteria were applied to each species.

Is there a possibility that the Proposal will:

- substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;
- result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or
- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

Migratory birds are not generally recognised as being threatened in Australia but are protected under bilateral international agreements, including the China-Australia Migratory Bird Agreement, the Japan-Australia Migratory Bird Agreement and the Republic of Korea-Australia Migratory Bird Agreement. The inland (non-coastal) areas of the Pilbara bioregion are within the arid zone, and the overall harshness of the environment means that only a few migratory marine species are resident. The richness of the total avifauna in the bioregion as a whole (resident and non-resident) is due mainly to the diversity of habitats, particularly those on or near the coast (Johnstone et al. 2013).



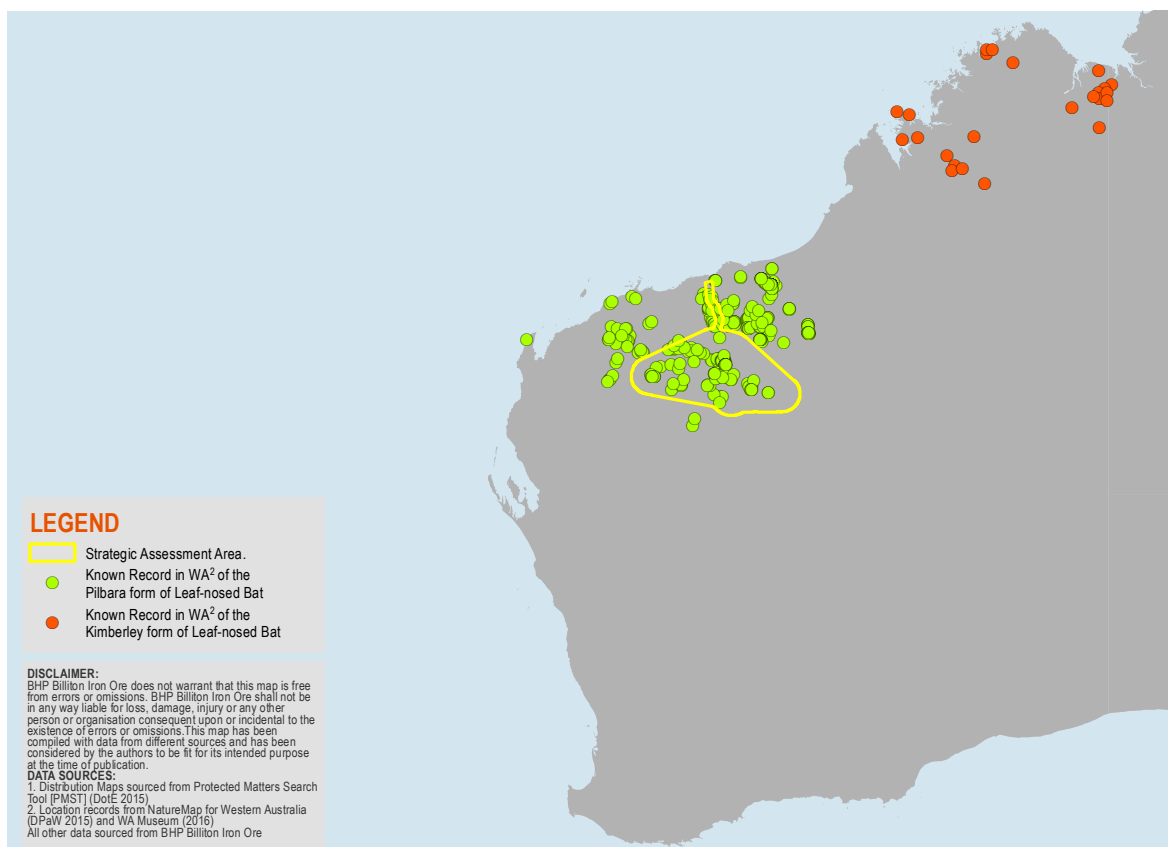
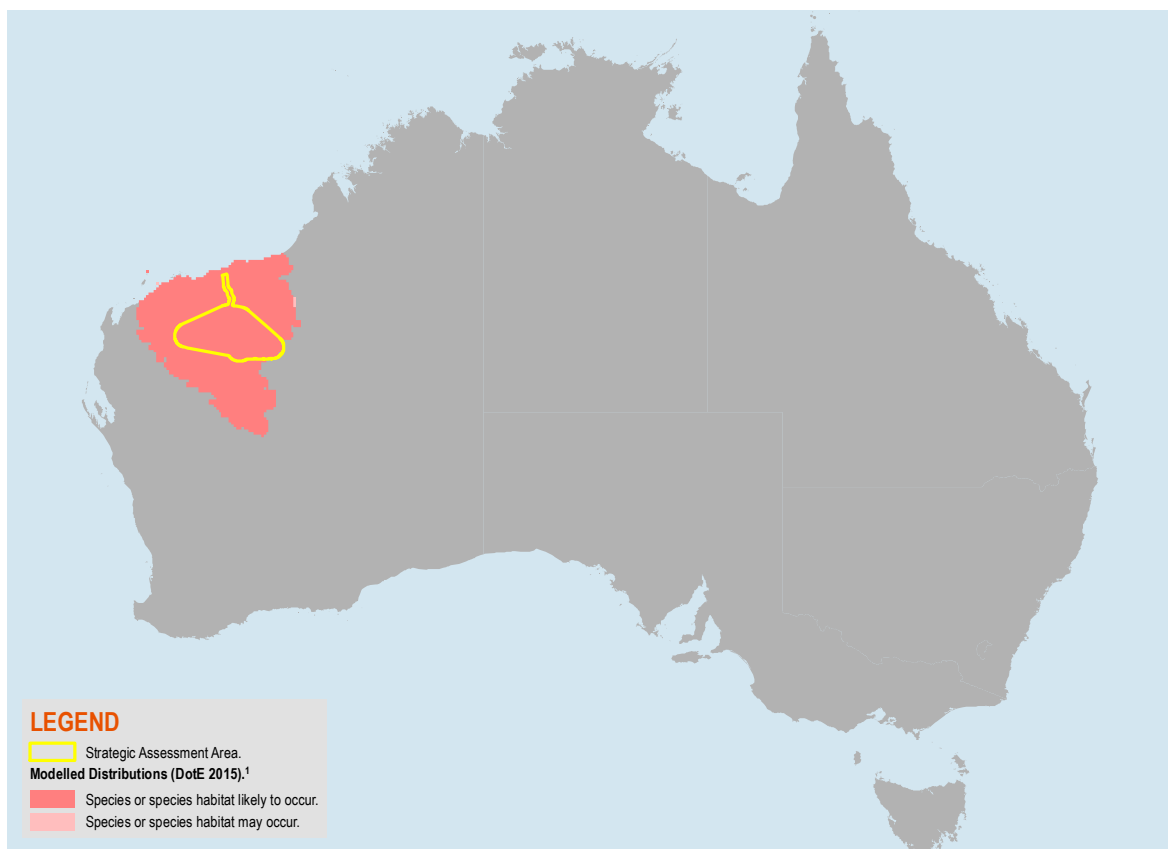
Pilbara Strategic Assessment

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Figure 9 Greater bilby distribution relative to the Strategic Assessment Area

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Environmental Approvals



Pilbara Strategic Assessment

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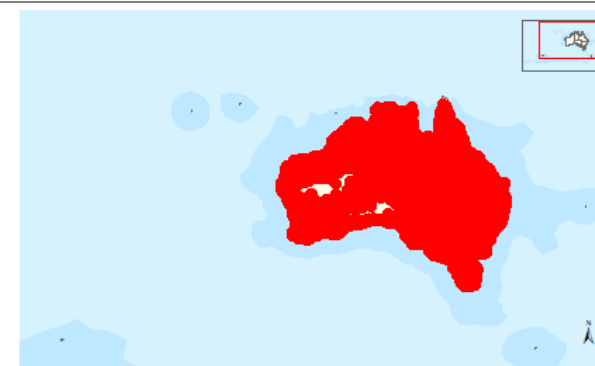
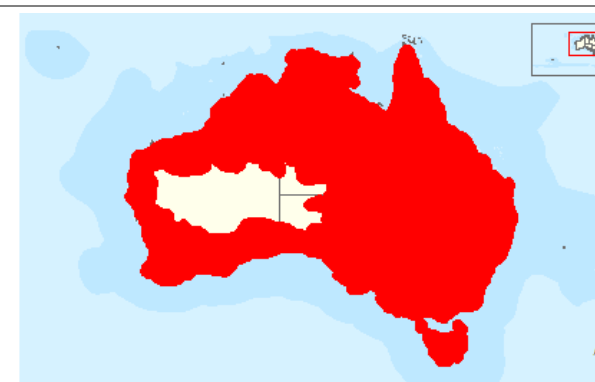


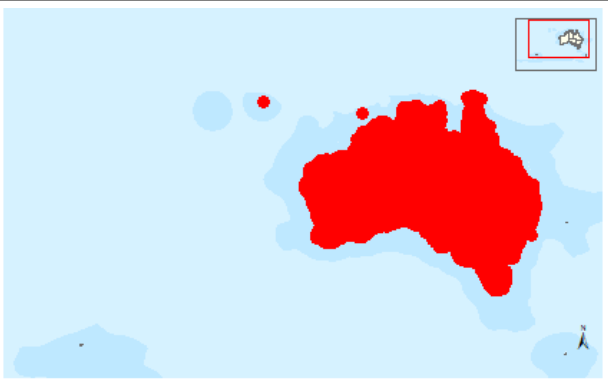
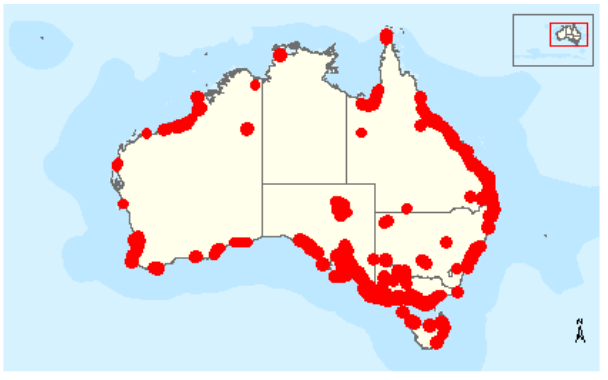
Figure 10 Distribution and known records of the Pilbara leaf-nosed bat

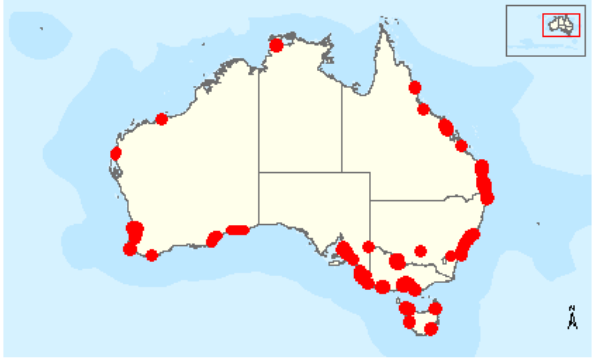
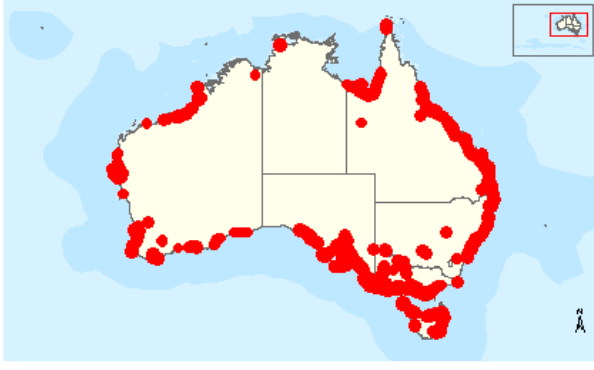
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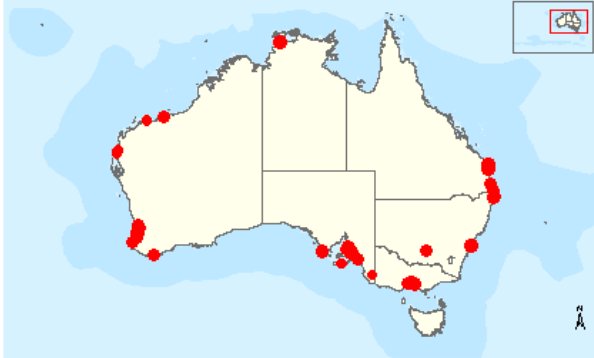
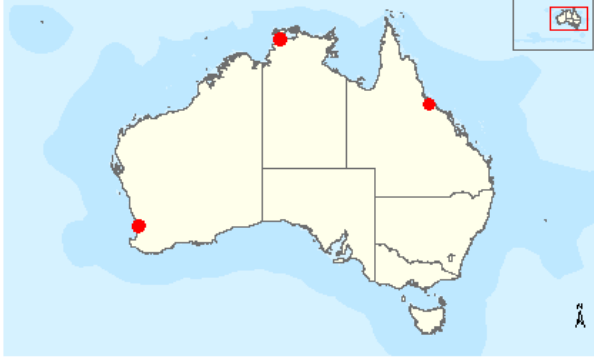
Each of the migratory species that have been recorded within the Strategic Assessment Area is described in Table 3. The assessment of potential impact based on the DotE (2013) significant impact criteria indicates that implementation of the Proposal is not likely to substantially modify important habitat for migratory species that have been recorded within the Strategic Assessment Area. Based on habitat preference types, implementation of the Proposal will not cause the introduction of an invasive species becoming established in important habitat for migratory species, nor will it seriously disrupt the lifecycle of ecologically significant proportions of the population of any listed migratory species in Table 3. The justification for this conclusion is described in Table 3 for each of the migratory species

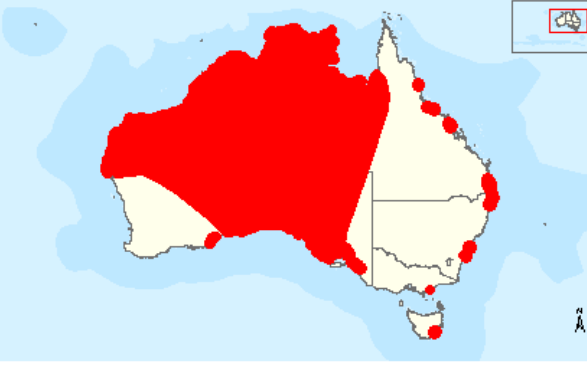
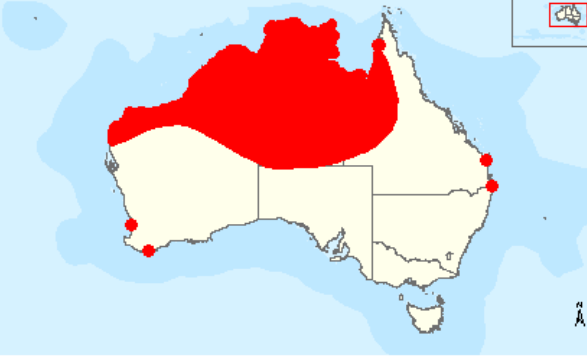
Table 3: Habitat and distribution of listed migratory marine birds

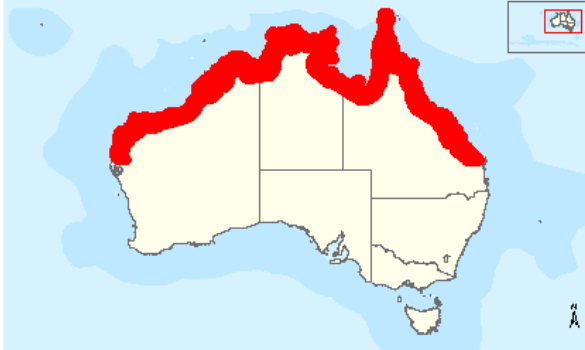
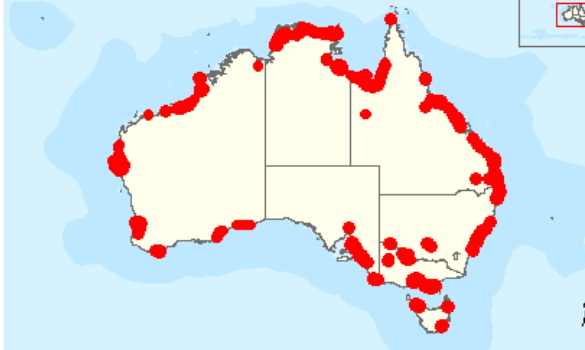
Species	Habitat and Distribution ¹	
Garganey <i>Anas querquedula</i>	Occurs sparsely across most of Australia (excluding SA) with the majority of records occurring in inland waterways of Victoria. Breeds in Western Eurasia then winters in Australia from October to February. Prefers large freshwater or brackish lakes. As the vast majority of records occur outside the Pilbara and there are no records in the Full Development Scenario, the risk is considered to be very low.	Distribution map not available.
Fork-tailed swift <i>Apus pacificus</i>	Distributed across Australia, mainly along the south-eastern coastline in Victoria and NSW. This species is almost exclusively aerial and occurs mainly over dry or open habitats. Breeds in Siberia then spends winters in Australia from October to April. As this species mainly occurs on the east coast of Australia and there are relatively few records in the Full Development Scenario, the cumulative risks from mining are considered low.	
Cattle egret <i>Ardea ibis</i>	Occurs across almost all of Australia except the very arid inland areas of north-western SA, south-western NT, and central WA. A relatively recent arrival to Australia (1948), it prefers terrestrial wetlands but has also been recorded in semi-arid regions. Generally does not migrate out of Australia. With nearly 100,000 records in Australia and only one in the Full Development Scenario, this species is not considered at risk.	


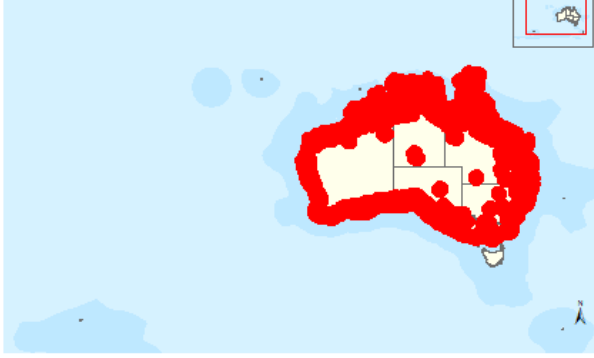
Species	Habitat and Distribution ¹	
Eastern great egret <i>Ardea modesta</i>	<p>Covers nearly the entire continent except a small area of extremely arid central Australia. Breeding populations mostly occur in the tropical Top End of the NT, but several more occur scattered across QLD, SA, NSW, Victoria and WA. Non-breeding birds occur across most of Australia. Recorded in a wide range of wetland habitats. Generally does not migrate out of Australia. The risk to this species is considered negligible due to the large number of records outside of the Pilbara and the low number records in the Full Development Scenario.</p>	
Sharp-tailed sandpiper <i>Calidris acuminata</i>	<p>Occurs along all coastlines of Australia. Most inland records are of birds in passage. Breeds in Siberia in May/June, and then migrates to Australia to stay from September to April. During the non-breeding season, over 90% of the world's population occurs in Australia. Prefers muddy edges of wetlands. The Port Hedland Saltworks is considered an important site for this species. As it is primarily a coastal species, the risk of impact from mining is considered low.</p>	

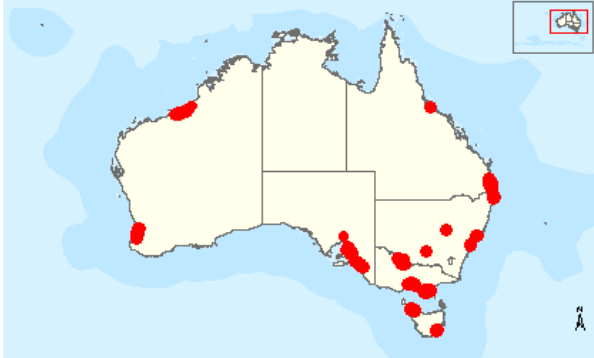
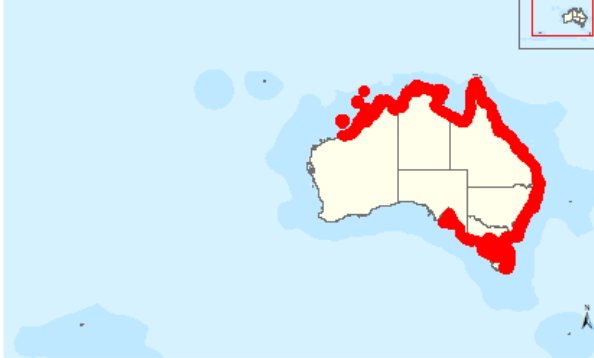
Species	Habitat and Distribution ¹	
Pectoral sandpiper <i>Calidris melanotos</i>	<p>Distributed along the coastline of Australia, mostly concentrated in the southeast. Rarely recorded in WA. Breeds in northern Russia and North America, and migrates to Australia in northern hemisphere winter. Prefers shallow fresh to saline wetlands with open fringing mudflats. Considered to be a low risk due to the majority of records occurring outside the Pilbara, and no records occurring in the Full Development Scenario.</p>	
Red-necked stint <i>Calidris ruficollis</i>	<p>A commonly recorded species along most of the Australian coastline. Breeds in Siberia and Alaska, then winters in Asia and Australia. Approximately 80% of the non-breeding population occurs in Australia. With no records in the Full Development Scenario and the vast majority of records outside of the Pilbara, this species is at low risk to mining impacts.</p>	

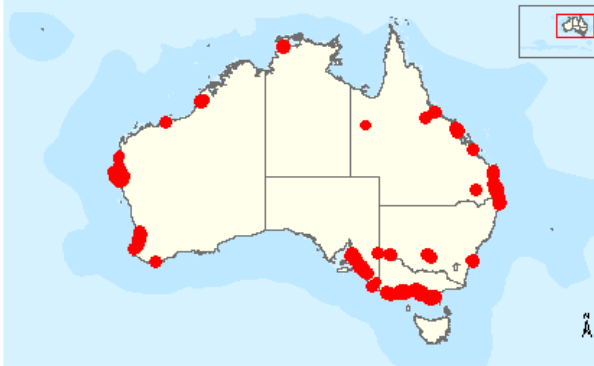
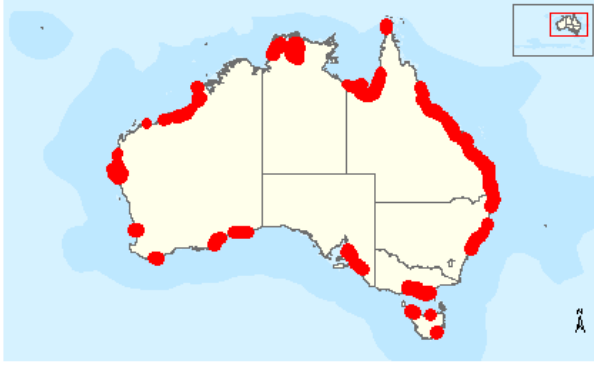
Species	Habitat and Distribution ¹	
<p>Long-toed stint <i>Calidris subminuta</i></p>	<p>Recorded along the coastline of most of Australia. Rarely recorded in the east and more commonly recorded in WA and the NT. Breeds in Siberia and migrates to Asia, with a few birds making it as far as Australia. Those that do disperse across the continent from the Pilbara to the coast of SA. Most return to Siberia in March/April. No important sites in Australia for this species. No records from the Full Development Scenario, risk considered low.</p>	 <p>Note: The record at the Newman Sewage Farm is not shown on the distribution map as it does not yet appear on the PMST.</p>
<p>Little Ringed Plover <i>Charadrius dubius</i></p>	<p>Recorded only rarely in Australia along the west and south coast. Breeds in northern Africa, Europe and Asia, and then migrates to south-east Asia for winter. Only a few make it to Australia and there are no important sites for this species in Australia. With minimum records in the Pilbara and the majority of the species occurring outside of Australia, the risk to this species is considered very low.</p>	

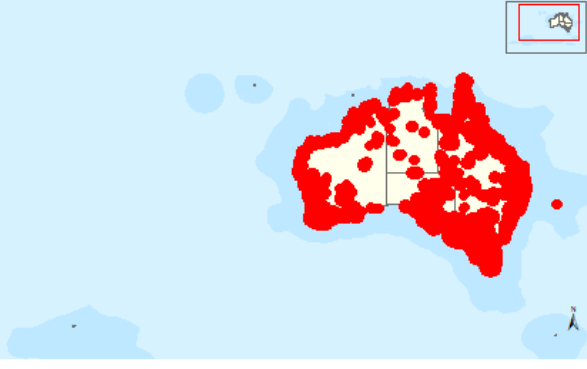
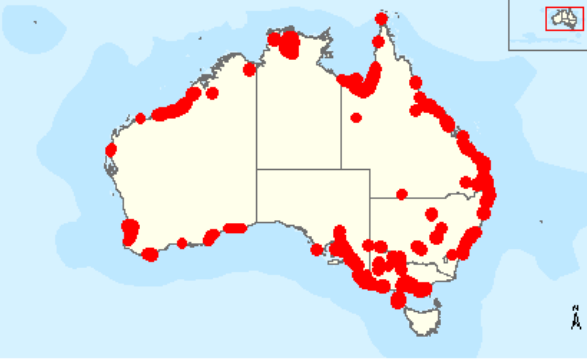
Species	Habitat and Distribution ¹	
Oriental Plover <i>Charadrius veredus</i>	<p>Breeds In northern China and Mongolia, with the bulk of the population spending the non-breeding period in northern Australia. Occurs in both coastal and inland areas. All internationally important sites in the non-breeding period are in northern Australia, including the Port Hedland Saltworks and Dampier Saltworks in the Pilbara, and 80-Mile Beach and Roebuck Bay in Dampierland. As the important sites do not intersect the Full Development Scenario and there are no records in the Full Development Scenario, the risk to this species is considered low.</p>	
Gull-billed Tern <i>Gelochelidon nilotica</i>	<p>Occurs mostly inland, but outside breeding season shows a preference for saltmarshes and lagoons near the coast. Found on all continents except Antarctica. In Australia, commonly recorded along the coastline (excluding the Nullarbor), as well as the south-east interior. Movements are not well understood but generally it spends southern hemisphere summers in Australia and winters in New Guinea or Indonesia. With substantial numbers outside the Pilbara, the risk to this species is considered negligible.</p>	<p>Distribution map not available.</p>
Oriental Pratincole <i>Glareola maldivarum</i>	<p>With a total population estimated at 2.88 million, this species is widespread in northern Australia, especially along the coast of the Pilbara, the Kimberley and the northern Australia. Breeds in south-east Asia and winters in Australia. No internationally important sites occur in the Pilbara; however two occur nearby in Dampierland, namely 80 Mile Beach and Roebuck Bay. As the vast majority of the population occurs outside the Pilbara the risk to this species is considered low.</p>	

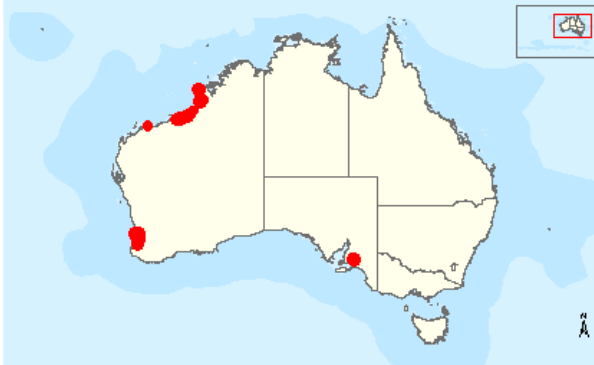
Species	Habitat and Distribution ¹	
Barn Swallow <i>Hirundo rustica</i>	<p>Total population estimated at 190 million. Breeds in North America, Europe, northern Africa and Asia and migrates to northern Australia to winter. Recorded in Australia along the northern third of the continent including inland around freshwater wetlands. Highly adaptable to differing habitats, preferring a good supply of artificial structures for nesting and perching. The risk to this species is considered negligible.</p>	
Black-tailed Godwit <i>Limosa limosa</i>	<p>Recorded in all states and territories of Australia, however prefers coastal regions. The largest populations in Australia occur in the Top End of the NT. Breeds in the far north areas of the world such as Iceland, northern Scandinavia, and Siberia, and then winters in Asia and Australia. Total population estimated at 1.3 million, with 160,000 occurring in Australia. No internationally important sites occur in the Pilbara. This species is considered at very low risk.</p>	

Species	Habitat and Distribution ¹	
Rainbow Bee-eater <i>Merops ornatus</i>	<p>Abundantly distributed across all of mainland Australia. Unknown total population size but presumed to be quite large based on reporting rate. Overall population trend increasing. Breeds in Australia, with some populations migrating north to Indonesia and Papua new Guinea for the austral winter. Inhabits a variety of habitats. There records located within the Full Development Scenario, however the species' large population numbers and ability to use alternative habitats indicates a low risk from cumulative mining impacts.</p>	
Eastern Osprey or Osprey <i>Pandion haliaetus</i>	<p>Considered moderately common in Australia. Mostly found in coastal areas but occasionally travel inland along major rivers. Breeding range extends around the northern coast of Australia, and non-breeding range extends along the entire coastline, becoming sparse in the south around Victoria and across the Nullarbor. Most birds stay in Australia all year but some migrate to Indonesia and Papua New Guinea. Australian population trend increasing. Risk to species considered low.</p>	

Species	Habitat and Distribution ¹	
Ruff <i>Philomachus pugnax</i>	<p>Considered a rare but regular visitor to Australia, recorded in all states and territories. Breeds in northern Europe and migrates mostly to Africa, India and southern Europe, with a few making their way to Australia each year from September to April. Prefers fresh or brackish wetlands with exposed mudflats. Total population unknown. Loss of habitat could potentially affect the species, however with the majority of the population outside of Australia and no records in the Full Development Scenario the risk is considered low.</p>	
Glossy Ibis <i>Plegadis falcinellus</i>	<p>Occurs throughout most of the world, with a total population of 1.2 to 3.2 million. Approximately 12% of the world population occurs in Australia, recorded in all states and territories except Tasmania. Prefers fresh water wetlands but occasionally found in coastal brackish wetlands. Considered migratory and nomadic, moving in response to good rainfall. Often migrates north in autumn and returns south to breeding areas in summer. Migration outside Australia is suspected but not confirmed. As a very mobile species, the risk from mining is considered low.</p>	<p>Distribution map not available.</p>
Little Tern <i>Sternula albifrons</i>	<p>Widely but patchily spread throughout Europe, Asia, Indonesia and Australasia. Total population estimated between 100,000 to 400,000 birds, with approximately 10% occurring in Australia. Strictly a coastal species, rarely foraging more than 50m inland. Three distinct populations in Australia, two of which are year-round residents in northern and eastern Australia, and one which migrates from Asia to spend the austral summer in Australia. As a strictly coastal bird, the risk of mining to this species is considered negligible.</p>	

Species	Habitat and Distribution ¹	
<p>Wood Sandpiper <i>Tringa glareola</i></p>	<p>Breeds in Scandinavia and Siberia and migrates to Africa and south-east Asia for winter, with a few making their way to north-west Australia. No internationally important sites in Australia. In WA, widespread but scattered in most regions. Prefers shallow freshwater wetlands. With only a very small proportion of the population occurring in the Pilbara and only three records in the Full Development Scenario the risk to this species is low.</p>	 <p>Note: The record/s at Newman are not shown on the distribution map due to lack of available data.</p>
<p>Common Sandpiper <i>Tringa hypoleucos</i></p>	<p>Occurs worldwide, breeding in norther Europe and Asia and then migrating to Africa, southern Asia and Australia. Recorded along all coastlines of Australia and in many inland areas as well, but concentrated in the north-west where it is widespread in small numbers. Total world population of 2.5 to 4 million individuals, with approximately 3,000 occurring in Australia. No internationally important sites in WA. As a common and highly mobile species, the risk from mining is considered low.</p>	

Species	Habitat and Distribution ¹	
Common Greenshank <i>Tringa nebularia</i>	<p>Broad worldwide distribution, breeding from western Europe to eastern Russia, and migrating to Africa, Asia and Australasia. Occurs at low densities along mudflats and inland wetlands. There are no internationally important sites in the Pilbara, however nearby Roebuck Bay and 80 Mile Beach in the Kimberly region of WA are considered important. Population estimate anticipated to increase after more comprehensive survey data becomes available. Risk to species from cumulative mining impacts considered low.</p>	
Marsh Sandpiper <i>Tringa stagnatilis</i>	<p>Breeds from eastern Europe to eastern Siberia, and then migrates to Africa, Asia and Australia. Found on coastal and inland wetlands throughout Australia, but concentrated in the south-east around Victoria and NSW. Global population estimated between 190,000 and 1.2 million. With the majority of the population occurring outside the Pilbara, the risk to this species is low.</p>	

Species	Habitat and Distribution ¹
<p>Common Redshank <i>Tringa totanus</i></p>	<p>Globally distributed, breeding from western Europe to central Asia, and then migrating to northern Africa, south and south-east Asia. Only a few migrate to Australia, concentrating around Roebuck Bay in WA, Spencer Gulf in SA and Coffs Harbour in NSW. Found at sheltered coastal wetlands such as bays, lagoons and saltmarshes. As the majority of the species do not occur in Australia it is considered to be a negligible risk.</p> 

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Attachment A – Protected Matters Search Tool report



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

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

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

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[Summary](#)

[Details](#)

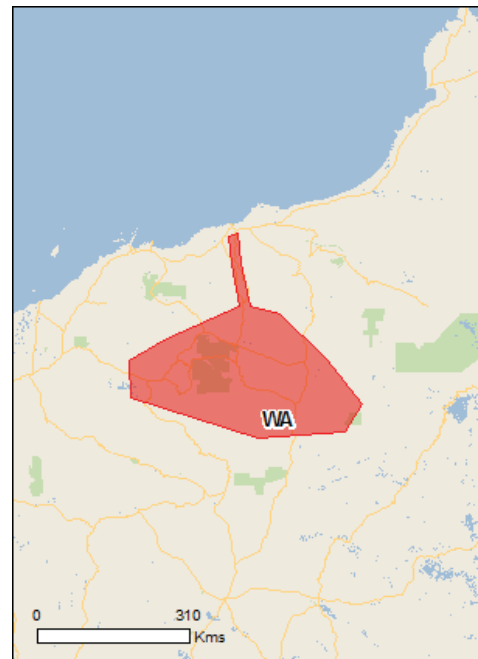
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

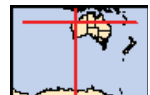
[Acknowledgements](#)



This map may contain data which are
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[Coordinates](#)

Buffer: 100.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	29
Listed Migratory Species:	58

Other Matters Protected by the EPBC Act

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

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage/index.html>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	3
Commonwealth Heritage Places:	None
Listed Marine Species:	106
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	1

Extra Information

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

State and Territory Reserves:	11
Regional Forest Agreements:	None
Invasive Species:	21
Nationally Important Wetlands:	8
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

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

Name

EEZ and Territorial Sea

Marine Regions

[\[Resource Information \]](#)

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name

[North-west](#)

Listed Threatened Species

[\[Resource Information \]](#)

Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat likely to occur within area
Polytelis alexandrae Princess Parrot, Alexandra's Parrot [758]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll [331]	Endangered	Species or species habitat known to occur within area
Macrotis lagotis Greater Bilby [282]	Vulnerable	Species or species

Name	Status	Type of Presence
Megaptera novaeangliae		habitat known to occur within area
Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Notoryctes caurinus		
Kakarratul, Northern Marsupial Mole [295]	Endangered	Species or species habitat known to occur within area
Rhinonictis aurantia (Pilbara form)		
Pilbara Leaf-nosed Bat [82790]	Vulnerable	Roosting known to occur within area
Plants		
Lepidium catapycnon		
Hamersley Lepidium, Hamersley Catapycnon [9397]	Vulnerable	Species or species habitat likely to occur within area
Pityrodia augustensis		
Mt Augustus Foxglove [4962]	Vulnerable	Species or species habitat likely to occur within area
Thryptomene wittweri		
Mountain Thryptomene [16645]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Aipysurus apraefrontalis		
Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Ctenotus angusticeps		
Airlie Island Ctenotus [25937]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Liasis olivaceus barroni		
Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat known to occur within area
Liopholis kintorei		
Great Desert Skink, Tjakura, Warrarna, Mulyamiji [83160]	Vulnerable	Species or species habitat may occur within area
Natator depressus		
Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Sharks		
Carcharodon carcharias		
Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Pristis clavata		
Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis		
Large-tooth Sawfish, Freshwater Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to occur within area

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

Listed Migratory Species [Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Foraging, feeding or related behaviour known to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Puffinus pacificus Wedge-tailed Shearwater [1027]		Breeding known to occur within area
Sterna caspia Caspian Tern [59467]		Breeding known to occur within area
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Sula leucogaster Brown Booby [1022]		Breeding known to occur within area
Migratory Marine Species		
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Carcharodon carcharias Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area

Name	Threatened	Type of Presence
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]		Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion cristatus Eastern Osprey [82411]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Species or species

Name	Threatened	Type of Presence
Pluvialis fulva Pacific Golden Plover [25545]		habitat known to occur within area Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land - Defence - NEWMAN TRAINING DEPOT Defence - TOM PRICE TRAINING DEPOT

Listed Marine Species [\[Resource Information \]](#)

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

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

Name	Threatened	Type of Presence
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]		Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Foraging, feeding or related behaviour known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Species or species habitat known to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur

Name	Threatened	Type of Presence
Limosa limosa Black-tailed Godwit [845]		within area Species or species habitat known to occur within area
Macronektes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Puffinus pacificus Wedge-tailed Shearwater [1027]		Breeding known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Sterna bengalensis Lesser Crested Tern [815]		Breeding known to occur within area
Sterna caspia Caspian Tern [59467]		Breeding known to occur within area
Sterna dougalli Roseate Tern [817]		Breeding likely to occur within area
Stiltia isabella Australian Pratincole [818]		Species or species habitat known to occur within area
Sula leucogaster Brown Booby [1022]		Breeding known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species

Name	Threatened	Type of Presence
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		habitat known to occur within area Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area
Fish		
Acentronura larsonae Helen's Pygmy Pipehorse [66186]		Species or species habitat may occur within area
Bulbonaricus brauni Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
Campichthys tricarinatus Three-keel Pipefish [66192]		Species or species habitat may occur within area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
Choeroichthys latispinosus Muiron Island Pipefish [66196]		Species or species habitat may occur within area
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
Corythoichthys flavofasciatus Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area
Cosmocampus banneri Roughridge Pipefish [66206]		Species or species habitat may occur within area
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Doryrhamphus multiannulatus Many-banded Pipefish [66717]		Species or species habitat may occur within area
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Festucalex scalaris Ladder Pipefish [66216]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus brocki Brock's Pipefish [66219]		Species or species

Name	Threatened	Type of Presence
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		habitat may occur within area Species or species habitat may occur within area
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Haliichthys taeniophorus Ribbioned Pipehorse, Ribbioned Seadragon [66226]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus spinosissimus Hedgehog Seahorse [66239]		Species or species habitat may occur within area
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area
Phoxocampus belcheri Black Rock Pipefish [66719]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paegnius Rough-snout Ghost Pipefish [68425]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Reptiles		
Acalyptophis peronii Horned Seasnake [1114]		Species or species habitat may occur within area
Aipysurus apraefrontalis Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
Aipysurus duboisii Dubois' Seasnake [1116]		Species or species habitat may occur within area
Aipysurus eydouxii Spine-tailed Seasnake [1117]		Species or species habitat may occur within area
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Aipysurus tenuis Brown-lined Seasnake [1121]		Species or species habitat may occur within area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area
Emydocephalus annulatus Turtle-headed Seasnake [1125]		Species or species habitat may occur within area
Ephalophis greyi North-western Mangrove Seasnake [1127]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Hydrelaps darwiniensis Black-ringed Seasnake [1100]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Hydrophis czeblukovi Fine-spined Seasnake [59233]		Species or species habitat may occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Hydrophis mcdowellii null [25926]		Species or species habitat may occur within area
Hydrophis ornatus Spotted Seasnake, Ornate Reef Seasnake [1111]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species

Name	Status	Type of Presence habitat may occur within area
Commonwealth Reserves Marine		[Resource Information]
Name	Label	
Eighty Mile Beach	Multiple Use Zone (IUCN VI)	

Extra Information

State and Territory Reserves		[Resource Information]
Name	State	
Barlee Range	WA	
Birriliburu	WA	
Collier Range	WA	
Karijini	WA	
Karlamilyi	WA	
Meenthen Station	WA	
Millstream Chichester	WA	
Mungaroona Range	WA	
North Turtle Island	WA	
Unnamed WA41696	WA	
Wanna	WA	

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

Name	Status	Type of Presence
Birds		
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer montanus		
Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Mammals		
Bos taurus		
Domestic Cattle [16]		Species or species habitat likely to occur within area
Camelus dromedarius		
Dromedary, Camel [7]		Species or species habitat likely to occur within area
Canis lupus familiaris		
Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus		
Goat [2]		Species or species habitat likely to occur within area
Equus asinus		
Donkey, Ass [4]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area

Plants

Andropogon gayanus Gamba Grass [66895]		Species or species habitat likely to occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area
Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Reptiles

Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area
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Nationally Important Wetlands		[Resource Information]
Name		State
De Grey River		WA
Eighty Mile Beach System		WA
Fortescue Marshes		WA
Karijini (Hamersley Range) Gorges		WA
Kookhabinna Gorge		WA
Leslie (Port Hedland) Saltfields System		WA
Millstream Pools		WA
Mt. Bruce coolibah-lignum flats		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 and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

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

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-21.70799 118.96633,-21.84713 119.4932,-22.5947 120.35163,-23.36197 121.00765,-23.83041 120.69086,-23.93844 119.10835,-23.27173 116.75943,-22.62318 116.74347,-22.25604 117.41761,-21.69888 118.76804,-20.99845 118.61066,-20.50724 118.55071,-20.46245 118.72506,-20.97377 118.80193,-21.70799 118.96633

Acknowledgements

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

- [Department of Environment, Climate Change and Water, New South Wales](#)
- [Department of Sustainability and Environment, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment and Natural Resources, South Australia](#)
- [Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [Environmental and Resource Management, Queensland](#)
- [Department of Environment and Conservation, Western Australia](#)
- [Department of the Environment, Climate Change, Energy and Water](#)
- [Birds Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- [Natural history museums of Australia](#)
- [Museum Victoria](#)
- [Australian Museum](#)
- [SA Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Atherton and Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [State Forests of NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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