



Yathroo Wind Farm

Targeted Shorebird Survey Report

Final

June 2026

NEOEN

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Targeted Shorebird Survey Report

Final

Prepared by
Umwelt (Australia) Pty Limited

On behalf of
Neoen Australia Pty Ltd

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Acknowledgement of Country

Umwelt acknowledges the Traditional Owners of Country throughout Australia and their continuing values, culture and connection to the land, waters and sky.

We pay our respects to Elders past and present.

The below image is from the artwork *Yapung Maryiyang* (Pathway Forward) by Saretta Fielding.



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Executive Summary

Aims and Objectives

Neoen Australia Pty Ltd is proposing the development of the Yathroo Wind Farm (the Project), located approximately 120 km north of Perth in the Shire of Dandaragan, Western Australia. The Project will comprise up to 65 wind turbine generators, a battery energy storage system and associated infrastructure. Given the presence of wetlands within and adjacent to the Project Area, a targeted assessment of wetland-dependent birds, such as migratory shorebirds listed under the *Environment Protection and Biodiversity Conservation Act 1999*, was undertaken to support environmental approvals.

This report documents the outcomes of a comprehensive program to address requirements under the Department of Energy and the Environment (2017) *Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* and a Request for Information issued by the Department of Climate Change, Energy, the Environment and Water for the Project (ref: EPBC 2025/10390).

The approach has included a desktop assessment, habitat mapping and field surveys, with the primary objective of determining the occurrence, abundance, behaviour and habitat utilisation by conservation significant wetland-dependent bird taxa, and to evaluate the potential risk of impacts associated with the construction and operation of the proposed wind farm.

The field survey component was conducted between October 2024 and May 2026, during which 96 surveys were undertaken across 11 wetlands located within the Project Area and its immediate surrounds to target key focal species.

A total of 15 conservation significant wetland-dependent bird taxa were identified as focal species for this assessment, including:

- Blue-billed Duck (*Oxyura australis*)
- Pacific Golden Plover (*Pluvialis fulva*)
- Australian Painted Snipe (*Rostratula australis*)
- Bar-tailed Godwit (northern Siberian) (*Limosa lapponica menzbieri*)
- Black-tailed Godwit (*Limosa limosa*)
- Ruff (*Calidris pugnax*)
- Sharp-tailed Sandpiper (*Calidris acuminata*)
- Curlew Sandpiper (*Calidris ferruginea*)
- Long-toed Stint (*Calidris subminuta*)
- Red-necked Stint (*Calidris ruficollis*)
- Common Sandpiper (*Actitis hypoleucos*)
- Wood Sandpiper (*Tringa glareola*)
- Common Greenshank (*Tringa nebularia*)
- Glossy Ibis (*Plegadis falcinellus*)
- Osprey (*Pandion haliaetus*).

Habitat Assessment

At a regional scale, the assessment identified 361 wetlands within a 5 km buffer (the ‘Regional Context Area’) surrounding the Project Area. These wetlands comprise a range of geomorphic types, although the majority are damplands and sumplands. Importantly, suitability analysis based on geomorphic wetland types indicated that only a small proportion of wetlands provide high-quality habitat for conservation significant shorebirds and Blue-billed Duck. Specifically, only 23 wetlands (approximately 6.4%) were assessed as “known” or “likely” to support shorebird taxa of interest, and 18 wetlands (approximately 5.0%) for Blue-billed Duck. The vast majority of wetlands were considered unsuitable due to limited water availability, absence of mudflats or lack of appropriate foraging conditions.

Species Assemblage

Across all surveys, a total of 47 wetland-dependent bird taxa were recorded and this included nine taxa of conservation significance:

- Blue-billed Duck (*Oxyura australis*) – Priority 4 (listed by Department of Biodiversity, Conservation and Attractions)
- Bar-tailed Godwit (northern Siberian) (*Limosa lapponica menzbieri*) – EN & MI (EPBC Act) / CR & MI (BC Act)
- Black-tailed Godwit (*Limosa limosa*) – EN & MI (EPBC Act) / MI (BC Act)
- Ruff (*Calidris pugnax*) – MI (EPBC Act & BC Act)
- Sharp-tailed Sandpiper (*Calidris acuminata*) – VU & MI (EPBC Act) / MI (BC Act)
- Curlew Sandpiper (*Calidris ferruginea*) – CR & MI (EPBC Act) / CR (BC Act)
- Red-necked Stint (*Calidris ruficollis*) – MI (EPBC Act & BC Act)
- Wood Sandpiper (*Tringa glareola*) – MI (EPBC Act & BC Act)
- Common Greenshank (*Tringa nebularia*) – EN & MI (EPBC Act) / MI (BC Act).

The conservation significant taxa were recorded infrequently and in very low numbers, with most observations involving one or only a few individuals. No wetland within the Project Area supported numbers approaching thresholds for national or international significance under recognised criteria for migratory shorebirds. In contrast, the whole assemblage was dominated by widespread and abundant waterfowl species such as Grey Teal, Australian Shelduck and Black Swan, which collectively accounted for the majority of individuals recorded.

Spatial Utilisation

Based on the suitability analysis and field surveys, a strong spatial pattern in habitat suitability is clear. The highest quality wetlands were concentrated in the west of the Project Area within the Swan Coastal Plain (SWA02) IBRA subregion, whereas the proposed development footprint, including wind turbine infrastructure, is situated predominantly within the Dandaragan Plateau (SWA01) subregion in the east of the Project Area (which is also comparatively depauperate in suitable wetlands). This spatial separation trend was especially true for conservation significant shorebirds and is a key factor underpinning the overall assessment of low impact risk.

Temporal Utilisation

Temporal patterns of wetland use were strongly influenced by seasonal hydrology. Bird abundance generally peaked during late summer when ephemeral wetlands had dried and birds were concentrated at more permanent water bodies. During winter and spring, individuals were more dispersed across the broader landscape in response to increased availability of temporary wetland habitat.

Flight Behaviour

Targeted observations and more than 140 person-days of Bird and Bat Utilisation Surveys provided no evidence of routine flight activity by conservation significant taxa within the rotor-swept height or across the proposed turbine array. This indicates that the likelihood of collision risk with turbines or associated infrastructure is very low. Similarly, given the limited spatial overlap between key habitats and infrastructure, risks associated with habitat loss, disturbance, barrier effects or other indirect impacts are also considered low.

Key Findings

Overall, the findings of this assessment indicate that the proposed Yathroo Wind Farm is located in a landscape where high-quality habitat for conservation significant wetland-dependent birds is limited and largely occurs outside the proposed development footprint. The recorded presence of these taxa within the Project Area is infrequent and at low abundance, and there is no evidence of regular movement or utilisation of airspace that would increase susceptibility to turbine collision.

On this basis, it is concluded that the construction and operation of the Project is unlikely to result in significant impacts to migratory shorebirds or other conservation significant wetland-dependent bird taxa at local, regional, national or flyway scales. Any potential impacts that may occur are expected to be minor and limited to temporary disturbance affecting a small number of individuals. Continued monitoring and adaptive management are recommended to ensure that these conclusions remain valid throughout the life of the Project.

Abbreviations

Term	Definition
BBUS	Bird and bat utilisation survey
BESS	Battery energy storage system
BC Act	<i>Biodiversity Conservation Act 2016</i> (State of Western Australia)
DBCA	Department of Biodiversity, Conservation and Attractions
DC	Development Corridor
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DF	Disturbance Footprint
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EAAF	East Asian–Australasian Flyway
EP Act	<i>Environmental Protection Act 1986</i> (State of Western Australia)
EPBC Act	<i>Environment Protection Biodiversity Conservation Act 1999</i> (Commonwealth)
IBRA	Interim Biogeographic Regionalisation for Australia
MNES	Matters of National Environmental Significance
PA	Project Area
RCA	Regional Context Area
RSA	Rotor-swept area
WTG	Wind turbine generators

Contents

Executive Summary	i
Abbreviations	iv
1.0 Introduction	1
1.1 Scope and Objectives	2
2.0 Methods	6
2.1 Overview	6
2.2 Nomenclature and Taxonomy	6
2.3 Wetland-dependent Bird Taxa	6
2.4 Assessment Boundaries	8
2.5 Survey Guidelines	11
2.6 Desktop Assessment	11
2.6.1 Site Characteristics	11
2.6.2 Species Characteristics	11
2.6.3 Migratory Shorebird and Blue-billed Duck Habitat Assessment	13
2.7 Field Surveys	15
2.7.1 Survey Sites	15
2.7.2 Survey Timing and Personnel	18
2.7.3 Targeted Shorebird Surveys	22
3.0 Results and Discussion	23
3.1 Migratory Shorebird and Blue-billed Duck Habitat Assessment	23
3.1.1 Conservation Significant Wetland-dependent Bird Taxa of Interest	23
3.1.2 Habitat Assessment	25
3.1.3 Summary	34
3.2 Wetland-dependent Bird Surveys	35
3.2.1 Recorded Assemblage	35
3.2.2 Wetland Use (Spatial Patterns)	42
3.2.3 Seasonality (Temporal Patterns)	51
3.2.4 Conservation Significant Wetland-dependent Bird Taxa	53
3.2.5 Summary	60
4.0 Synthesis	61

4.1	Summary	64
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5.0	References	65
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Figures

Figure 1.1	The Yathroo Wind Farm Project Area	5
Figure 2.1	Habitat Assessment and Survey Boundaries	10
Figure 2.2	Location of Surveyed Wetlands	17
Figure 3.1	Geomorphic Wetlands Within the Regional Context Area Boundary	27
Figure 3.2	Expected Occurrence of Shorebird (and allies) Taxa of Interest at Wetlands Within the Regional Context Area	30
Figure 3.3	Expected Occurrence of Blue-billed Duck at Wetlands Within the Regional Context Area	33
Figure 3.4	Total Wetland-dependent Bird Counts in Each Survey	52

Tables

Table 1.1	RFI Components Addressed in this Report	3
Table 2.1	Desktop Assessment Data Sources – Site Characterisation	11
Table 2.2	Desktop Assessment Data Sources – Species Characterisation	12
Table 2.3	Categories for Likelihood of Occurrence	12
Table 2.4	Geomorphic Wetland Categories (from Semeniuk & Semeniuk, 1995)	14
Table 2.5	Surveyed Wetlands	15
Table 2.6	Survey Schedule	19
Table 2.7	Survey Personnel	21
Table 3.1	Shorebird (and allies) Foraging Ecology Group Associations for the Taxa of Interest	24
Table 3.2	Expected Occurrence of Shorebird (and Allies) Taxa of Interest at Wetlands Within the Regional Context Area and Project Area	29
Table 3.3	Expected Occurrence of Blue-billed Duck at Wetlands Within the Regional Context Area and Project Area	32
Table 3.4	Wetland-dependent Bird Taxa Recorded	36

Table 3.5	Maximum Single-day Counts of Wetland-dependent Bird Taxa within the Survey Area (all Wetlands Pooled)	40
Table 3.6	The Number of Surveys per Wetland in which each Taxon was Recorded	43
Table 3.7	Total Count Per Taxon Per Wetland (All Surveys Pooled)	47
Table 3.8	Summary of Focal Conservation Significant Wetland-dependent Bird Taxa	54
Table 3.9	Commentary on Focal Taxa of Conservation Significant Wetland-dependent Birds	56
Table 4.1	Potential Impacts to Wetland-dependent Birds	62

Appendices

Appendix A	Wetland Dependand Species
Appendix B	Representative Wetland Photographs
Appendix C	Conservation Significant Taxa Records

1.0 Introduction

Neoen Australia Pty Ltd (Neoen) is proposing to develop a wind farm in the locality of Yathroo, in the Shire of Dandaragan, in the south-west region of Western Australia. The Yathroo Wind Farm Project (the Project) will be located approximately 120 km north of Perth, 11 km south of the town of Dandaragan, 12 km south-east of Cataby and 7 km north of Regans Ford, as shown in **Figure 1.1**. The Project is expected to comprise up to 65 wind turbines generators (WTG), a battery energy storage system (BESS), and associated ancillary infrastructure (including below-ground and overhead cables, and internal access tracks).

Previous ecological surveys have been undertaken within the Project Area to support impact assessments and environmental approvals for the Project under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Western Australian *Environmental Protection Act 1986* (EP Act) and these include:

- Basic and Targeted fauna assessment (Umwelt, 2025a).
- Detailed and Targeted flora and vegetation assessment (Umwelt, 2025c).
- Bird and bat utilisation surveys (Umwelt, 2025e, 2025b, 2025f, 2025g).
- Targeted fauna habitat assessment (Umwelt, 2025d).

A subset of fauna that may be at risk of impact by the Project are wetland-dependent birds (i.e. birds that depend on aquatic environments for feeding, breeding and/or roosting/resting). The desktop assessments and field surveys to date have identified 10 taxa of EPBC Act listed shorebirds that migrate annually between breeding grounds in the northern hemisphere (e.g., Siberia, Mongolia, Alaska) and non-breeding grounds in Australia, using the East Asian–Australasian Flyway (EAAF), that are either known to occur or considered to have a moderate or higher likelihood to occur within the Project Area (see Umwelt, 2025d for details). Those taxa are:

Family Charadriidae

1. Pacific Golden Plover (*Pluvialis fulva*)

Family Scolopacidae

2. Black-tailed Godwit (*Limosa limosa*)
3. Ruff (*Calidris pugnax*)
4. Sharp-tailed Sandpiper (*Calidris acuminata*)
5. Curlew Sandpiper (*Calidris ferruginea*)
6. Long-toed Stint (*Calidris subminuta*)
7. Red-necked Stint (*Calidris ruficollis*)
8. Common Sandpiper (*Actitis hypoleucos*)
9. Wood Sandpiper (*Tringa glareola*)
10. Common Greenshank (*Tringa nebularia*)

Four of the above taxa (Black-tailed Godwit, Common Greenshank, Curlew Sandpiper and Sharp-tailed Sandpiper) are also listed as Threatened under the EPBC Act and/or the Western Australian *Biodiversity Conservation Act 2016* (BC Act). In addition, one taxon of Migratory waterbird (that is not within a family considered to be ‘shorebirds’, *sensu stricto*) is expected to occur with a moderate or higher likelihood in the Project Area:

Family Threskiornithidae

11. Glossy Ibis (*Plegadis falcinellus*)

The ibis has a similar ecology and habitat requirements to many ‘shorebirds’ and, thus, is assessed alongside the true shorebirds in this report.

One wetland-dependent bird taxon that is ranked as a priority species by the Western Australian Department of Biodiversity, Conservation and Attractions (DBCA) is known to occur within the Project Area.

Family Anatidae

12. Blue-billed Duck (*Oxyura australis*)

Further to these, in their correspondence ‘*Further information required for preliminary documentation for Yathroo Wind Farm, Western Australia*’ (DCEEW, 2025) to Neoen, the Department of Climate Change, Energy, the Environment and Water (DCCEEW) has also noted two Migratory (under the EPBC Act) wetland-dependent taxa of interest that are not outlined above (although both have been addressed in previous assessments for the Project):

Family Rostratulidae

13. Australian Painted Snipe (*Rostratula australis*)

Family Pandionidae

14. Osprey (*Pandion haliaetus*)

Therefore, there are 14 wetland-dependent bird taxa for which further information is required to guide design feasibility, and to satisfactorily assess the risk of impact to these taxa from the construction and operation of the proposed Yathroo Wind Farm.

Umwelt (Australia) Pty Ltd (Umwelt) was engaged by Neoen to undertake targeted wetland-dependent bird surveys and habitat assessments for the Project and this report outlines the findings of that work. It also discusses results in the context of the Request for Further Information (RFI) dated 23 March 2026 issued to Neoen by the DCCEEW (DCEEW, 2025).

1.1 Scope and Objectives

The scope of this report is to address requirements under the *EPBC Act Policy Statement 3.21—Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* as well as the RFI issued by DCCEEW to Neoen (ref: EPBC 2025/10390) under s95A(2) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Specific objectives of this scope of work are to:

- Undertake a sufficient number of suitable surveys to satisfy the survey coverage, timing and effort requirements of *EPBC Act Policy Statement 3.21*.
- Provide a summary of the survey effort and results including:
 - Shorebird numbers and diversity recorded
 - Shorebird behaviours recorded
 - Survey conditions
 - Number of observers and level of experience
 - Methods used to conduct surveys
 - Relevant habitat characteristics.
- Identify and describe the abundance and status of species occurring within, adjacent to, or moving through/over the Project Area. Include all listed taxa that transit or overfly the area enroute to other locations.
- Provide details of the flight characteristics and behaviours of the listed bird taxa, specifically regarding occupying or overflying the Project Area within the rotor swept area and transmission lines.
- Document migratory flight paths across the Project Area where possible, including frequency of use, timing (day/night), numbers, and seasonal patterns, especially for migratory overflying taxa.
- Provide detailed mapping of suitable habitat for all listed threatened or migratory bird taxa which:
 - Includes habitat that is within and adjacent to the Project Area to provide regional context.
 - Identifies permanent or seasonal water bodies or watercourses within proximity of the disturbance footprint to demonstrate the use of different habitat features within and outside the Project Area.

Sections of this report and the associated components of the RFI issued by DCCEE are provided in **Table 1.1**.

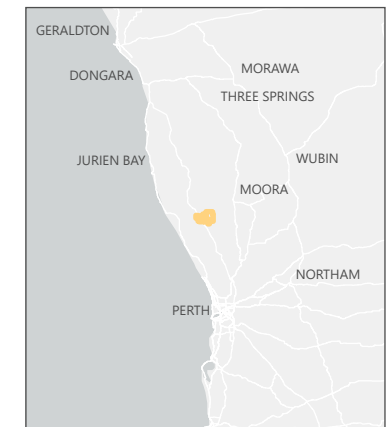
Table 1.1 RFI Components Addressed in this Report

RFI Item	Report Section
1.2(a) Population Status Identify and describe the abundance and status of species occurring within, adjacent to, or moving through/over the project area. Include all listed species that transit or overfly the area enroute to other locations.	Section 3.2
1.2(b)(i) Site Utilisation by Bird Species Details of the flight characteristics and behaviours of the listed bird's species, specifically regarding occupying or overflying the project area within the rotor swept area and transmission lines.	Section 3.2
1.2(a)(ii) Site Utilisation by Bird Species Document migratory flight paths across the site, including frequency of use, timing (day/night), numbers, and seasonal patterns, especially for migratory overflying species.	Section 3.2

RFI Item	Report Section
1.2(c)(i) Habitat Mapping Provide detailed mapping of suitable habitat for all listed threatened or migratory bird species which: • Includes habitat that is within and adjacent to the project to provide regional context. • Identifies permanent or seasonal water bodies or watercourses within proximity of the disturbance footprint to demonstrate the use of different habitat features within and outside the project area. • Provides the images separately as attachments in JPEG format.	Section 3.1.2 and Appendix B
2.1 All MNES Where relevant to the general scope of this report, RFI items concerning migratory shorebirds have been addressed where possible. Examples include risk of electrocution from transmission lines, and impacts of shadow “flicker”, blade “glint”, blade throw and night lighting.	Section 4.0

Legend

-  Project Area
-  National Park, Reserves and State Forests
-  Railway
-  Road
-  Watercourse
-  Waterbody



Scale 1:320,000 at A4
GDA2020 MGA Zone 50



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2.0 Methods

2.1 Overview

Wetlands within the Project Area and surrounds (the Regional Context Area) were identified and assessed for their likelihood to support wetland-dependent bird taxa of interest (based on desktop assessment and field knowledge, where applicable). In addition, a subset of wetlands (mostly within the Project Area) were surveyed for the presence of all wetland-dependent bird taxa. The findings of these studies were combined to assess the expected impacts of the Project to wetland-dependent bird taxa of interest. Detailed description of the methodology used follows below.

2.2 Nomenclature and Taxonomy

As per the recommendations of the EPA (2020), the nomenclature and taxonomic order presented in this report are generally based on the Western Australian Museum's (WAM) *Checklist of the Fauna of Western Australia 2025* (WAM, 2025). An exception to this is for avifauna, where the globally unified taxonomy and nomenclature of AviList (AviList, 2025) has been followed.

The use of subspecies is strictly limited to situations where the taxonomic distinction has direct relevance to the conservation status or listing of a taxon. Subspecific epithets are not provided for taxa that are not listed under federal or state acts (or ranked as priority species by DBCA). Subspecific epithets are only presented for non-conservation significant taxa when this is required to differentiate from a listed (or ranked) conspecific subspecies. For example, "*Calyptrorhynchus banksii escondidus*" (a non-Threatened taxon of red-tailed black cockatoo) would be used for clarity and to discriminate from the Threatened conspecific "*Calyptrorhynchus banksii naso*" but "*Nephrurus levis*" (a knob-tailed gecko taxon) would be used to refer to any of its non-Threatened subspecies (*N. l. levis*, *N. l. occidentalis* and *N. l. pilbarensis*). In some cases, the distinction between these non-Threatened subspecies is of ecological curiosity but for almost all applications in environmental assessment the use of only genus and species epithets is suffice (and avoids unnecessary detail).

English common names of taxa, where available, are generally used throughout the body text, with Latin names provided alongside corresponding common names in tables in appendices. Common names are treated as proper nouns (although not strictly the case) and capitalised to improve readability. It is noted that this does not follow conventions set out in the *Australian Government Style Manual* (APSC, 2026) but it is a deliberate decision to assist the reader and does follow the practices of WAM (2025) and AviList (2025).

Taxa are presented in taxonomic order (unless specifically noted otherwise) following the appropriate authority (WAM 2025 or AviList 2026).

2.3 Wetland-dependent Bird Taxa

Various terms and definitions for wetland-dependent bird taxa are used in the literature (e.g. "waterbirds", "waterfowl", "seabirds", "waders", "shorebirds") and these can be ambiguous, confusing, synonymous, overlapping and/or, for some taxa, not strictly correct for the ecology exhibited by the animal itself. For the purposes of this report, any taxon that is reliant on (i.e. an

obligate user) or very strongly associated with waterbodies (including oceans), wetlands or drainage systems for most of its life cycle is termed “wetland-dependent”. For the Western Australian avifauna, these include all members of the following families:

- Anseranatidae (Magpie Goose)
- Anatidae (Ducks, geese and swans)
- Rallidae (Rails, crakes, coots and gallinules)
- Gruidae (Cranes)
- Podicipedidae (Grebes)
- Haematopodidae (Oystercatchers)
- Recurvirostridae (Stilts and avocets)
- Charadriidae (Plovers, lapwings and dotterels)
- Rostratulidae (Painted-snipes)
- Jacanidae (Jacanas)
- Scolopacidae (Sandpipers, snipes and allies)
- Glareolidae (Pratincoles and coursers)
- Laridae (Gulls, terns and noddies)
- Stercorariidae (Skuas and jaegers)
- Phaethontidae (Tropicbirds)
- Spheniscidae (Penguins)
- Oceanitidae (Austral storm-petrels)
- Diomedidae (Albatrosses)
- Hydrobatidae (Northern storm-petrels)
- Procellariidae (Petrels, shearwaters and prions)
- Ciconiidae (Storks)
- Fregatidae (Frigatebirds)
- Sulidae (Boobies and gannets)
- Anhingidae (Darters)
- Phalacrocoracidae (Cormorants and shags)
- Threskiornithidae (Ibises and spoonbills)
- Ardeidae (Hérons, egrets and bitterns)
- Pelecanidae (Pelicans)
- Pandionidae (Osprey)
- Acrocephalidae (Reed-warblers)
- Cisticolidae (Cisticolas and allied warblers)

In addition, one or more taxa (but not all members) within the following families are considered wetland-dependent:

- Burhinidae (Stone-curlews and thick-knees)
- Accipitridae (Hawks, eagles, kites and harriers)
- Alcedinidae (Kingfishers)
- Acanthizidae (Thornbills, gerygones and scrubwrens)
- Pachycephalidae (Whistlers and shrikethrushes)
- Rhipiduridae (Fantails)
- Monarchidae (Monarch flycatchers and magpie-larks)
- Petroicidae (Australasian robins)
- Locustellidae (Grassbirds and songlarks)
- Estrildidae (Munias, finches and allies)
- Motacillidae (Wagtails and pipits)

Several subcategories of wetland-dependent avifauna are recognised and these reflect the ecology and life/behavioural characteristics of the taxa concerned. These subcategories may be useful for delineating groups of taxa that interact with their environment in a broadly similar manner and, therefore, may be susceptible to similar environmental impacts or risks. The subcategories are:

- **Waterfowl.** Ducks, geese, swans and allies that primarily feed, loaf and roost on open water.

- **Shorebirds.** Small to medium-sized taxa that typically have long legs and bills, and that forage on invertebrates along shorelines, mudflats and intertidal zones (e.g. plovers, sandpipers, godwits).
- **Wading Waterbirds.** Usually large wetland birds and ‘non-shorebird’ taxa that forage in shallow water or wet substrates, typically including herons, egrets, ibis, spoonbills, cranes, and storks.
- **Aquatic Waterbirds.** Taxa adapted to swimming or diving on open water, or skulking in reedbeds and wetland edges (e.g. grebes, cormorants, darters, pelicans, crakes and rails).
- **Seabirds.** Taxa primarily dependent on the marine environment for feeding and that are often pelagic or coastal breeders (e.g. albatrosses, shearwaters, gannets, many gulls/terns).
- **Wetland Associated.** Generally “non-waterbird” taxa (*sensu stricto*) such as raptors or passerines that are nevertheless strongly associated with wetland habitats (e.g. fish-feeding birds of prey, reed-warblers, mangrove specialists) or immediately adjacent areas.

A list of the Western Australian taxa within each family and the sub-category of wetland-dependency is provided in **Appendix A**.

Surveys undertaken as part of the targeted assessment here focussed on these taxa, with specific attention paid to taxa of conservation significance (i.e. those listed under state or federal legislation or ranked as priority species by DBCA). The majority of conservation significant taxa are with the ‘Shorebird’ category and undertake trans-equatorial, long-range migrations between breeding areas in northern latitudes of the northern hemisphere and non-breeding grounds in the southern hemisphere. Marchant et al. (2010) define these taxa as all members of the order Charadriiformes (families Turnicidae, Burhinidae, Haematopodidae, Recurvirostridae, Charadriidae, Rostratulidae, Jacanidae, Scolopacidae, Glareolidae, Laridae, and Stercorariidae) and this is reflected in the categorisation presented here (see **Appendix A**). The term ‘shorebird’ will be used, throughout, to refer just to the Charadriiformes and it is noted (as highlighted by CoA, 2017) that the majority of conservation significant taxa present in Australia come from two families in particular: Charadriidae and Scolopacidae.

2.4 Assessment Boundaries

The proposed Yathroo Wind Farm Project Area is shown in **Figure 2.1**. Four boundaries associated with the Project Area (15,617.6 ha) were relevant to this assessment and were provided by Neoen prior to the commencement of the field investigations:

- **The Project Area (PA)** – the outer boundary in which the Project will be developed (15,617.6 ha).
- **The Development Corridor (DC)** – a broader area (3,442.9 ha) inside which the proposed infrastructure will be constructed that allows for some realignment or repositioning of the Project components.
- **The Disturbance Footprint (DF)** – a narrower and more-specific boundary comprising the areas that are considered likely to be directly disturbed from the construction and/or operation of the wind farm (based on an indicative layout of infrastructure), totalling 729.1 ha.
- **The Regional Context Area (RCA)** – a 5 km buffer around the PA (totalling 59,918.3 ha) to provide an “adjacent” area of regional context that contains similar habitat features to those within the DF (in particular) and the PA (more broadly) that is likely to be “within proximity” of the sources of potential impact. The buffer was chosen as an ecologically relevant distance in which local

movements (i.e. those considered likely to be of greatest concern for most conservation significant taxa of concern) are expected to occur for the majority of likely-to-occur taxa protected under MNES.

The PA, DC, DF and RCA boundaries are shown in **Figure 2.1**.

On-ground (field) assessments were focussed within the PA (with some intersecting with the DC and DF) and desktop assessments extended out to the RCA boundary. The term '**Survey Area**' is used in a general sense to refer to the area in which studies were undertaken (and may reflect the PA or RCA depending on the context in which it is used).

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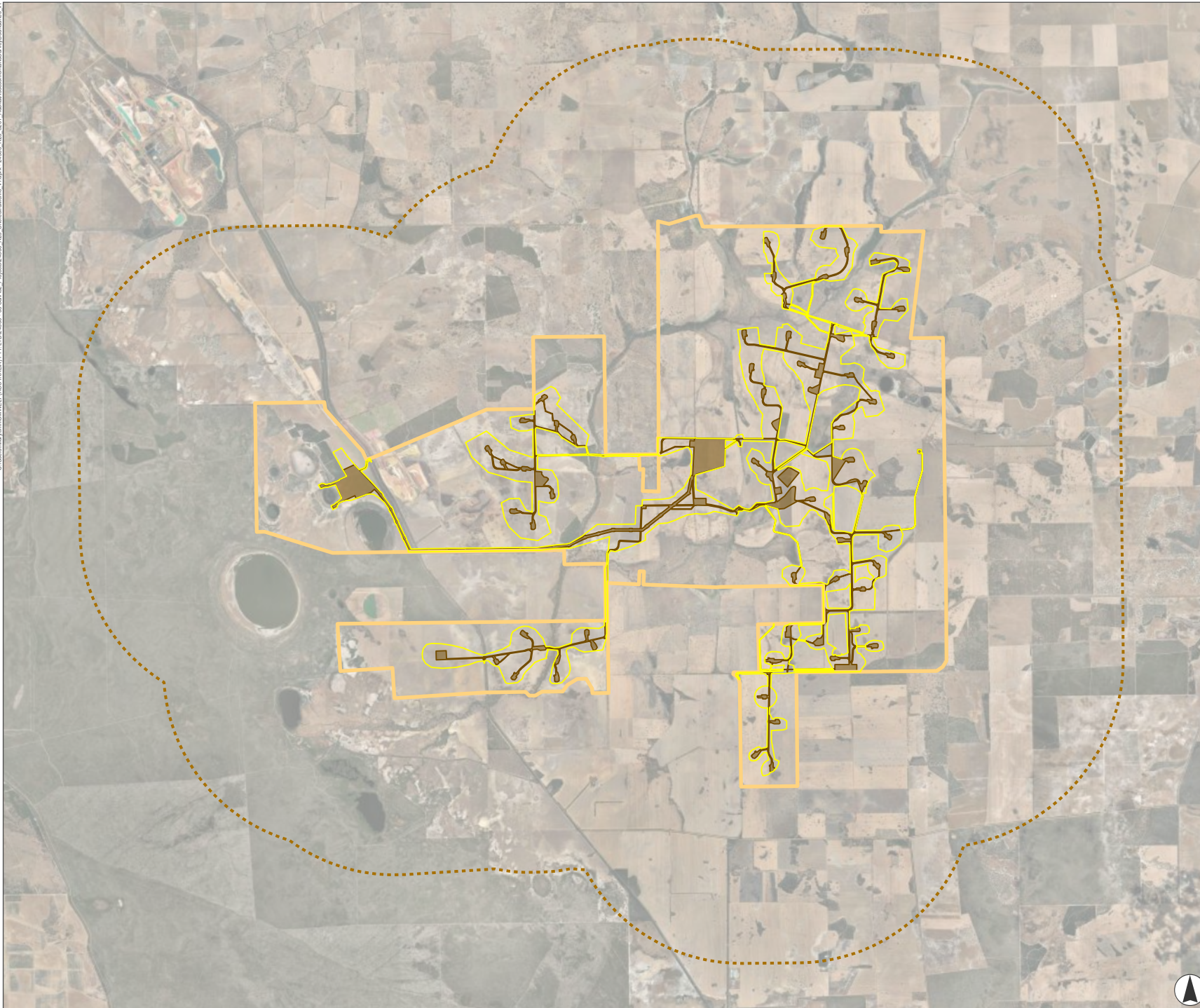


FIGURE 2.1

Habitat Assessment and Survey Boundaries

Legend

-  Project Area
-  Regional Context Area
-  Disturbance Footprint
-  Development Corridor



Scale 1:150,000 at A4
GDA2020 MGA Zone 50



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2.5 Survey Guidelines

The purpose, scope and methods of targeted shorebird surveys subject to this report have been designed in accordance with the following guidelines:

- Department of Energy and the Environment (DEE) (2017) Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species
- DCCEEW (2024a) Onshore Windfarm Guidance
- Environmental Protection Authority (EPA) (2020) Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment.

2.6 Desktop Assessment

Prior to the commencement of the survey program, a review of desktop data sources was undertaken to characterise potential site and species characteristics of the PA and surrounds (e.g. the RCA). The following sections provide an overview of the data sources and method used during the desktop assessment.

2.6.1 Site Characteristics

Data sources used to inform the site characterisation component of the desktop assessment are presented in **Table 2.1**. Data were reviewed to understand possible environmental drivers of site utilisation by migratory shorebirds and determine suitable timing for sampling.

Table 2.1 Desktop Assessment Data Sources – Site Characterisation

Aspect	Data Source
Biogeography	Interim Biogeographic Regionalisation for Australia (IBRA) Version 7 (Subregions) (DCCEEW, 2023)
Climate	Climate Data Online (BoM, 2025)
Soil Landscape Mapping	Soil Landscape Mapping – Best Available (DRIRP-027) (DPIRD, 2025)
Hydrology	Hydrographic Catchments – Basins (DWER-027) (DWER, 2018) Hydrographic Catchments – Catchments (DWER-028) (DWER, 2024a) Ramsar Sites (DBCA-010) (DBCA, 2017) Directory of Important Wetlands in Australia – Western Australia (DBCA-045) (DBCA, 2026)
Vegetation	Pre-European Vegetation (DPIRD-006) (DPIRD, 2019) Native Vegetation Extent (DPIRD-005) (DPIRD, 2023)

2.6.2 Species Characteristics

Database searches were undertaken for migratory shorebirds previously recorded within and in proximity to the Project Area as part of the desktop assessment. This involved obtaining and reviewing reports from previous biodiversity surveys conducted in the vicinity of the Project Area using the Index of Biodiversity Surveys for Assessments (IBSA) database (DWER, 2024b). Data sources used to inform the species characterisation component of the desktop assessment are presented in **Table 2.2**.

Table 2.2 Desktop Assessment Data Sources – Species Characterisation

Aspect	Data Source
Conservation Significant Fauna	DBCA NatureMap database (DBCA, 2024b) DBCA Threatened and Priority Fauna Database (DBCA, 2024a) BirdLife DataZone (BirdLife Australia, 2025) Atlas of Living Australia (ALA, 2025) eBird Database (Cornell Lab of Ornithology, 2025)
Matters of National Environmental Significance (MNES)	EPBC Protected Matters Search Tool (DCCEEW, 2024b)

A likelihood of occurrence assessment was then conducted for all migratory shorebirds identified during the desktop assessment. This assessment considered species biology, distribution, habitat preferences, the availability and quality of suitable habitat, and existing records within or near the Project Area.

Each species was assigned a likelihood ranking (**Table 2.3**) based on these factors, ranging from ‘Known’ to ‘Very Low’, reflecting the probability of the species occurring within the Project Area. The assessment was then updated following the completion of the survey program to reflect results obtained during surveys with the results presented in **Table 3.8**.

Table 2.3 Categories for Likelihood of Occurrence

Likelihood Category	Description
Known	The species has been recorded during the field survey or from recent, reliable records within the Project Area.
High	The Survey Area contains suitable habitat and there are recent records of the species occurring in close proximity to the Project Area. OR Species known distribution overlaps the Project Area which contains suitable habitat.
Moderate	The species is known from the Desktop Study Area (Project Area plus a 20km buffer) and some preferred habitat is present within the Survey Area. Aerial foragers and other migratory birds that may overfly the Survey Area are also included in this category.
Low	The species has been recorded within the Desktop Study Area however, there is limited habitat (i.e. quantity, type and quality) within the Survey Area. This may include marginal and isolated habitat with limited ability for the species to access. The species may disperse through the Project Area infrequently and is unlikely to depend on the habitat for survival.
Very Low	The Project Area offers limited to no potential habitat for the species, is outside its known range, and/or is lacking broader habitat requirements.

2.6.3 Migratory Shorebird and Blue-billed Duck Habitat Assessment

The PA and RCA contain a number of wetlands that may provide suitable habitat for migratory shorebirds listed under the EPBC Act and BC Act. Semeniuk and Semeniuk (1995) provided a wetland classification system based on landform (e.g. basin, flat or slope) and water permanence and the thirteen resultant geomorphic wetland categories are shown in **Table 2.4**. Following this system, the geomorphic wetlands of the Swan Coastal Plain have been delineated by DBCA (2025) and this information has been used here, in conjunction with in-field assessments (of wetland features and bird presence) and existing data (i.e. database searches), to determine the locations that were most likely to support migratory shorebirds or Blue-billed Duck within the RCA. Each wetland within the RCA was assigned a likelihood rating as follows:

- **Known** – the group/taxon has been previously recorded from the wetland.
- **Likely** – the wetland has suitable and sufficient features that make it likely to support the group/taxon.
- **Possible** – the wetland may occasionally have conditions suited to the group/taxon (e.g. seasonal inundation, or years of favourable rainfall that result in standing water or mudflats).
- **Unlikely** – the wetland is not expected to provide suitable habitat for the group/taxon.

Table 2.4 Geomorphic Wetland Categories (from Semeniuk & Semeniuk, 1995)

Wetland Category	Description
Lake	Permanently inundated basin. A large, often deep depression that holds permanent or semi-permanent water, typically supporting aquatic vegetation and open water habitats.
Sumpland	Seasonally inundated basin. A low-lying depression that fills with water seasonally, often forming shallow wetlands that dry out in summer.
Playa	Intermittently inundated basin. A shallow, ephemeral basin that periodically fills with water, typically found in arid or semi-arid regions.
Dampland	Seasonally waterlogged basin. A seasonally waterlogged area that rarely floods, typically supporting sedgeland or woodlands adapted to moist but not inundated conditions.
River	Permanently inundated channel. A large, flowing body of water that moves continuously along a defined channel from higher to lower elevations.
Creek	Seasonally inundated channel. A small stream or minor tributary that often flows intermittently and feeds into larger water bodies.
Wadi	Intermittently inundated channel. A dry riverbed or valley that temporarily carries water during periods of heavy rain, common in desert landscapes.
Trough	Seasonally waterlogged channel. A linear depression or elongated basin that can collect water or sediment, often formed by tectonic or erosional processes.
Floodplain	Seasonally inundated flat. A flat area adjacent to rivers or creeks that is periodically inundated during high flows, supporting riparian and flood-tolerant vegetation.
Barlkarra	Intermittently inundated flat. An intermittently inundated flat typically surrounding playa landforms and subject to episodic flooding following significant rainfall events but will remain dry for extended periods.
Palusplain	Seasonally waterlogged flat. A broad, flat landscape that becomes seasonally waterlogged, often supporting dampland or sumpland vegetation communities.
Paluslope	Seasonally waterlogged slope. A gently sloping area on the margins of palusplains that experiences seasonal waterlogging and supports transitional wetland vegetation.
Palusmont	Seasonally waterlogged highlands. A wetland type found on sloping terrain, where water accumulates due to impeded drainage, often forming peat-rich soils.

2.7 Field Surveys

2.7.1 Survey Sites

While migrant shorebirds (and wetland-dependent taxa, in general) may potentially make use of any of the geomorphic wetland categories noted in **Section 2.6.3**, above, the 2 that are most likely to regularly support shorebirds in the vicinity of the Project Area are sumplands and lakes. A total of 10 such wetlands within the Project Area, as listed in **Table 2.5** and shown in **Figure 2.2**, appear to provide the best migratory shorebird habitat and were the focus of field assessments. One (1) additional high-potential wetland (WE-01), outside of the PA, was also included in the field surveys. Thus, up to 11 wetlands were assessed in any one survey. Brief descriptions of all wetlands are provided in **Table 2.5**. Note that there is no “WE-03” as this site was established for BBUS but was not considered suited to ongoing monitoring of wetland-dependent birds. Representative photographs of wetlands are provided in **Appendix B** where available.

Table 2.5 **Surveyed Wetlands**

Wetland Code	Wetland Description
WE-01	Sumpland. Smaller but likely to be permanently (or near-permanently) flooded. Dead stag trees and water-level branches are dense across much of its area. Some fringing grasses, rushes and <i>Melaleuca</i> sp. trees but also muddy shorelines present. Somewhat secluded. Stock appear to be restricted (fenced). This may be very well suited to some of the migrant waders that strongly prefer freshwater environments.
WE-02	Lake. Lake Yangy. The second-largest open-water wetland in the Project Area. Generally barren with bare edges; entire shoreline is unvegetated. Substrate appears to be harder-pan than (i). Water permanency uncertain. Appears to be shallower throughout. It may provide suitable foraging habitat for migrant waders but the exposed nature of the lake may limit some species.
WE-04	Sumpland. Smaller wetland that encircles a dam that retains water throughout the year with some fringing Flooded Gum (<i>Eucalyptus rudis</i>), and seasonally flooded area with grasses and rushes. Stock access the wetland regularly.
WE-05	Sumpland. Smaller wetland partly encircled by Flooded Gum (<i>Eucalyptus rudis</i>) and has numerous (live) <i>Melaleuca</i> sp. trees within the surface water area (providing vegetation cover for birds on the water surface) which is seasonal. Stock access the wetland.
WE-06	Sumpland. Moderate-sized, seasonal wetland wholly encircled by Flooded Gum (<i>Eucalyptus rudis</i>) and <i>Melaleuca</i> sp. trees, with extensive grasses (that may flood in winter) in the main wetland body area. A small dam in the middle retains water for some of the year but whole wetland dries out for several months. Stock have previously accessed the wetland.
WE-07	Sumpland. Large seasonal wetland wholly encircled by Flooded Gum (<i>Eucalyptus rudis</i>) and <i>Melaleuca</i> sp. trees, with extensive areas of bare mud in the central wetland body area. The rim of trees affords this wetland a separation from surrounding environments. Stock have previously accessed the wetland.
WE-08	Sumpland. Dam and seasonally flooded area with limited fringing vegetation but, at times, extensive areas of mud. These mudflat areas are most extensive on the

Wetland Code	Wetland Description
	north side of Bidgerabbie Road but dry out across the summer months. Well suited to smaller non-migrant shorebirds.
WE-C1	Sumpland. Seasonally flooded with large areas of (live) <i>Melaleuca</i> sp. trees. Clay base. Areas of flooded grass and rushes. Likely to offer a range of microhabitats for shorebirds but probably less suited to those species that prefer open, exposed areas. Extensively and regularly impacted by cattle.
WE-C2	Lake. The largest wetland within the Project Area that appears to be permanently flooded with broad areas of adjacent flooded grassland in winter and broad areas of exposed mudflats in the summer. Fringed by extensive beds of rushes and has numerous dead stag trees across much of its area. Deep-diving ducks have been noted so water-depth in the centre of the lake must be appreciable but it also offers plenty of shallow water opportunities. Cattle appear to have access to the lake. It is expected that this wetland will support the greatest diversity of waterbirds, generally, and that will provide the greatest opportunity for migrant shorebirds.
WE-C3	Sumpland. An extensive wetland with some fringing trees to the north-east and areas of fringing rushes (that may flood with higher water levels) along its southern edge. One of the first wetlands to dry out at the end of the winter but has a dam in the middle that does retain some water for much of the year. Appears to be a highly productive but short-lived wetland each season. Islands within the wetland afford shelter and potential breeding sites for wetland-dependent birds. At times this is likely to provide extensive areas of shallow-water and flooded grass/mudflats. Extensively and regularly impacted by cattle.
WE-C4	Dampland. Small wetland with flooded grasses and shallow surface water in the winter months. Scattered clumps of rushes are present throughout. Extensively and regularly impacted by cattle.

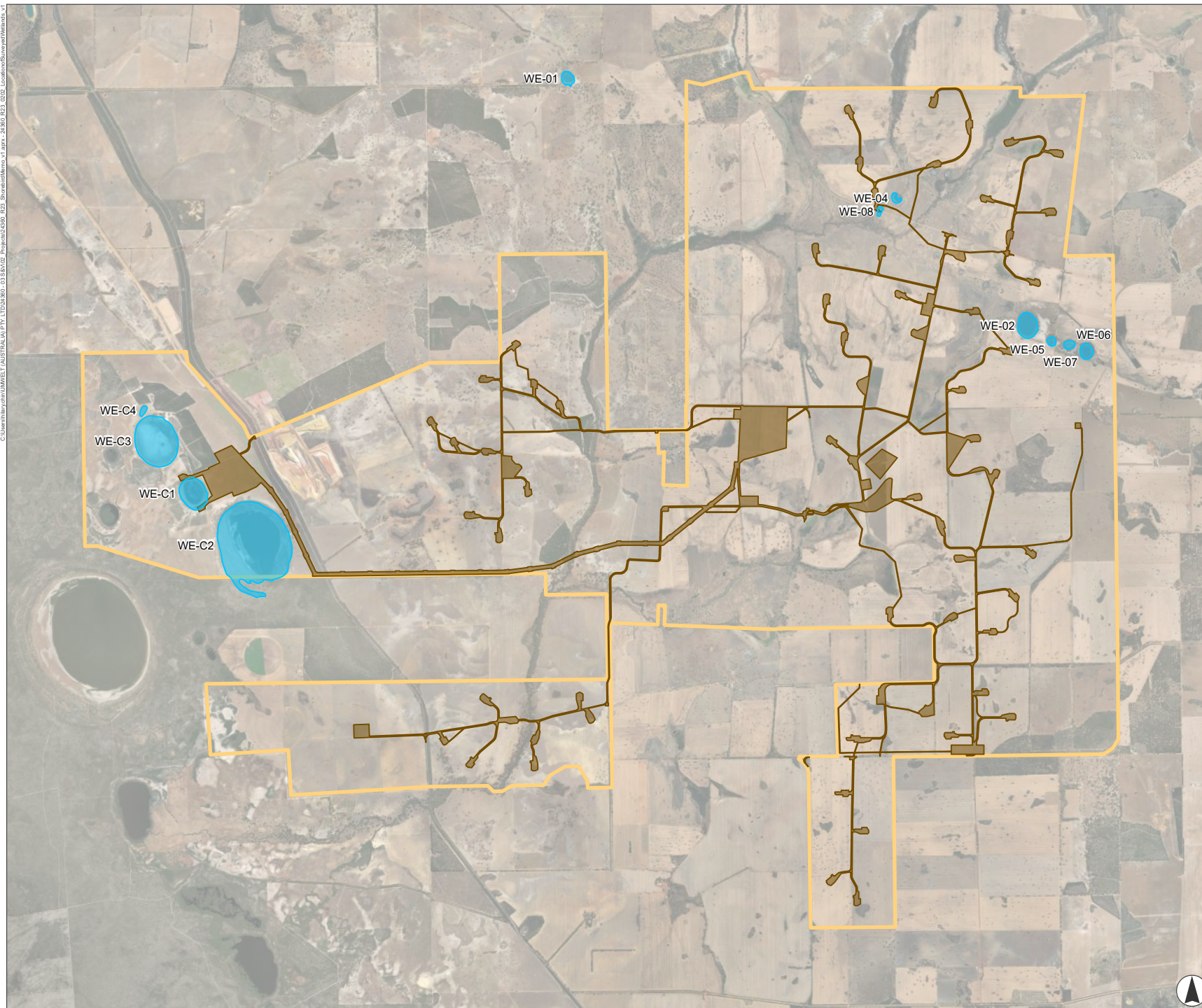


FIGURE 2.2
Location of Surveyed Wetlands

Legend

-  Project Area
-  Disturbance Footprint
-  Surveyed Wetlands



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2.7.2 Survey Timing and Personnel

Wetland-dependent bird surveys were undertaken at the 11 survey wetlands in conjunction with other field assessments (e.g. Basic and Targeted surveys, BBUS or habitat assessments) or as stand-alone targeted surveys when wetland-dependent bird species are most likely to occur. Up to 12 seasonal visits were made to each wetland between October 2024 and May 2026, with the survey schedule and personnel indicated in **Table 2.6**.

Table 2.6 Survey Schedule

Season	Survey	Date(s)	Personnel	Wetland											Total Wetlands Surveyed
				WE-01	WE-02	WE-04	WE-05	WE-06	WE-07	WE-08	WE-C1	WE-C2	WE-C3	WE-C4	
NB	BT01	29/10/2024 to 5/11/2024	JR, GB								X *				1
NB	BBUS02	15/02/2025	JR, TK, IS	X	X							X			3
B	BBUS03	4/05/2025 to 7/05/2025	WB, FN, GB	X	X						X	X			4
B	HA01	24/06/2025 to 26/06/2025	WB, GB, MHR	X	X							X			3
B	BBUS04	22/07/2025 to 24/07/2025	LA, RT, MR, MHu	X	X *							X			3
NB	TS01	23/09/2025	JR, TK	X	X	X					X	X			5
NB	BBUS05	13/10/2025 to 17/10/2025	WB, DL	X	X		X	X	X		X	X	X	X	9
NB	TS02	2/12/2025	WB, PC	X	X		X	X	X	X	X	X	X	X	10
NB	TS03	17/12/2025	FN, GB	X	X	X	X	X	X	X	X	X	X	X	11
NB	TS04	28/01/2026	LC, FN	X	X	X	X	X	X	X	X	X	X	X	11

Season	Survey	Date(s)	Personnel	Wetland											Total Wetlands Surveyed
				WE-01	WE-02	WE-04	WE-05	WE-06	WE-07	WE-08	WE-C1	WE-C2	WE-C3	WE-C4	
NB	BBUS06	16/02/2026 to 20/02/2026	LC, FN, MHu, DL	X	X *	X	X	X	X	X	X	X	X	X	11
NB	TS05	12/03/2026	FN, GB	X	X	X	X	X	X	X	X	X	X	X	11
B	BBUS07	18/05/2026 to 22/05/2026	TK, BO, FN, MHu	X	X	X	X	X	X	X	X	X	X	X	11
Total Surveys				12	14	6	7	7	7	6	11	12	7	7	96

* = two surveys conducted in period.

NB = non-breeding (generally migrant shorebirds in Australia).

B = breeding (generally migrant shorebirds in Northern Hemisphere).

BBUS = bird and bat utilisation survey.

HA = habitat assessment.

TS = targeted survey.

Table 2.7 Survey Personnel

Initials	Personnel	Position
BO	Brittany Osborn	Senior Ecologist
DL	Deon Loo	Ecologist
FN	Frederik Niclauss	Ecologist
GB	Grace Ball	Ecologist
IS	Indigo Sibanda	Ecologist
JR	Jeremy Ringma	Principal Ecologist
LA	Loren Appleby	Principal Ecologist
LC	Liam Chirio	Senior Ecologist
MHr	Monica Hrubanova	Ecologist
MHu	Mark Hutchinson	Ecologist
MR	Madison Roberts	Ecologist
PC	Pia Coventry	Operations Manager
RT	Ray Turnbull	Senior Ecologist
TK	Tevita Koloamatangi	Senior Ecologist
WB	Wes Bancroft	Principal Ecologist

2.7.3 Targeted Shorebird Surveys

For each survey, observers used a telescope and binoculars to identify and count all wetland-dependent birds present at each wetland. Where applicable, the following were also noted:

- wetland conditions (including water levels, health of vegetation and degree of disturbance)
- indicators of breeding (nests, chicks, plumage, behaviour)
- flight details for MNES protected taxa including minimum, maximum, and modal flight height (above ground level) and flight duration.

3.0 Results and Discussion

3.1 Migratory Shorebird and Blue-billed Duck Habitat Assessment

3.1.1 Conservation Significant Wetland-dependent Bird Taxa of Interest

Previous desktop assessments, the field surveys (see **Section 3.2** below) and the DCCEE RFI (2025) have highlighted 15 focal taxa of conservation significant wetland-dependent birds for the Project. As outlined in **Section 1.0**, these comprise:

- Ten (10) shorebird taxa (Pacific Golden Plover, Black-tailed Godwit, Ruff, Sharp-tailed Sandpiper, Curlew Sandpiper, Long-toed Stint, Red-necked Stint, Common Sandpiper, Wood Sandpiper and Common Greenshank; see also **Section 2.3** for definition), one (1) wading waterbird (Glossy Ibis) and one (1) waterfowl (Blue-billed Duck) that were identified in previous studies for the site as having a Moderate or higher likelihood of occurrence within the Project Area.
- Two (2) taxa (Australian Painted Snipe and Osprey) highlighted by DCCEE in their RFI (2025) but that were previously assessed as having a Low or lesser likelihood of occurrence within the Project Area.
- One (1) shorebird taxon (Bar-tailed Godwit) that was previously assessed as having a Low or lesser likelihood of occurrence within the Project Area but has subsequently been recorded on site.

All of the shorebird taxa of interest, Glossy Ibis and Osprey (i.e. 13 taxa) are listed as Migratory under the EPBC Act. Five (Bar-tailed Godwit, Black-tailed Godwit, Common Greenshank, Curlew Sandpiper and Sharp-tailed Sandpiper) are also listed as Threatened under the EPBC Act and/or BC Act. The Australian Painted Snipe is Threatened under the EPBC Act and/or BC Act, and the Blue-billed Duck is ranked as a Priority 4 (Rare, Near Threatened and other species in need of monitoring) taxon by DBCA (but is not presently listed under the EPBC Act and/or BC Act).

The Glossy Ibis and Australian Painted Snipe have a similar ecology and habitat requirements to many 'shorebirds' *sensu stricto* and, thus, are assessed alongside the true shorebirds in this report. The Blue-billed Duck and Osprey stand apart from the remainder, in terms of their ecology, and, as such, are treated separately.

3.1.1.1 Feeding Ecology

Shorebird feeding ecology can be grouped into three broad categories that reflect preferred habitat:

1. **Coastal Mudflat and Estuarine Specialists.** These taxa prefer intertidal mudflats and sandflats along estuaries, bays, coastal lagoons and tidal shores where they feed mainly on benthic invertebrates (worms, molluscs) by deep probing or surface pecking in soft sediments.
2. **Freshwater Wetland Foragers.** These taxa prefer inland wetlands, floodplains, and shallow freshwater lakes where they probe or pick for aquatic invertebrates and small crustaceans in soft mud or shallow water.

3. **Grassland/Open Area Foragers.** These taxa prefer open grassy plains or dry mudflats, often away from water where they use visual cues to pick insects and other terrestrial invertebrates from the substrate surface.

The associations for each of the thirteen shorebird and allies taxa are shown in **Table 3.1**. While not always the first-preferred habitat, the Project Area provides at least some suitable foraging opportunities for all of the highlighted taxa. While many shorebird taxa may be adaptable (at least occasionally) and use habitats outside of their core preference (even temporarily), it is the presence of prey species (driven by habitat) and accessibility (e.g. through appropriate water levels) that usually dictate the suitability of a site for shorebirds. Any factors that influence these, such as the water pH, salinity of the water, water discharge and/or groundwater drawdown are also likely to impact on the species composition (and abundance) of a site. This may be especially true for species that have a strong preference for freshwater in the region (e.g. Black-tailed Godwit, Common Greenshank, Wood Sandpiper and Sharp-tailed Sandpiper).

Table 3.1 Shorebird (and allies) Foraging Ecology Group Associations for the Taxa of Interest

Species	Coastal Mudflat and Estuarine Specialists	Freshwater Wetland Foragers	Grassland/Open Area Foragers
Pacific Golden Plover	++	++	+++
Australian Painted Snipe		+++	++
Bar-tailed Godwit	+++	++	
Black-tailed Godwit	+	+++	
Ruff	++	+++	+
Sharp-tailed Sandpiper	+++	++	
Curlew Sandpiper	+++	++	
Long-toed Stint	++	+++	
Red-necked Stint	+++	++	
Common Sandpiper	+++	++	
Wood Sandpiper		+++	
Common Greenshank	+++	+++	
Glossy Ibis	+	+++	+

The Blue-billed Duck is a highly aquatic deep-diving taxon that generally prefers large, permanent, freshwater to mildly saline wetlands with deep water and, often, dense aquatic vegetation. It may also use artificial wetlands (including sewage ponds) with suitable water depth and quality. Blue-billed

Ducks feed on aquatic invertebrates and vegetation, predominantly collected by diving. The Project area provides several wetlands that suit this taxon.

The Osprey forages almost exclusively on live fish, typically captured by plunge-diving into open water in lakes, estuaries and coastal environments. The taxon is a highly mobile raptor with a broad foraging range and is most closely associated with marine or near-marine environments. The larger, permanent waterbodies within the Project Area may provide for opportunistic foraging sites, rather than core habitat.

3.1.2 Habitat Assessment

3.1.2.1 Wetland Occurrence

There are 360 wetlands that have been recognised by DBCA (2025) that occur within the Regional Context Area (RCA; a 5 km buffer around the Project Area) and these fall into the following Semeniuk and Semeniuk (1995) geomorphic wetland categories: ten lakes, 110 sumplands, 224 damplands, five floodplains, four palusplains and seven paluslopes. In addition, one sumpland that was not mapped by DBCA (2025) also occurs within the Project Area (in the chain of wetlands adjacent to Yangy Lake) and this has been included in the habitat assessment here. A map of the (total) 361 wetlands within the RCA boundary is provided in **Figure 3.1**. Seventy-seven of the wetlands occur within the Project Area boundary, as detailed by Umwelt (2025d).

The proportional representation of the six geomorphic wetland types is similar, to a degree, in the PA and RCA (as shown in **Table 3.2**), with the vast majority of wetlands being sumplands and damplands (and relatively few lakes, floodplains, palusplains and paluslopes). The key difference noted is that sumplands and damplands represent approximately 57% and 27%, respectively, of the wetlands in the PA but these proportions are roughly reversed for the greater RCA (31% and 62%, respectively). It is not expected, however, that this creates a substantial functional difference for conservation significant wetland-dependent birds in this instance (see **Sections 3.1.2.2** and **3.1.2.3**, below). Overall, the PA is representative of wetlands in the region and the opportunity for conservation significant wetland-dependent bird taxa is likely to be similar within and outside of the PA.

The PA (and, thus, RCA) sits at the interface of three IBRA subregions: SWA01 (Dandaragan Plateau) and SWA02 (Perth) within the Swan Coastal Plain bioregion, and GES02 (Lesueur Sandplains) within the Geraldton Sandplains bioregion. The majority of the PA (and RCA) is within either SWA01 or SWA02. By definition, the underlying geology of these subregions differs, and this has a direct influence on the type and prevalence of surface wetlands within their bounds (Desmond, 2001; Hill et al., 1996; Mitchell et al., 2002):

- **SWA01** is a well-drained, elevated lateritic plateau system, characterised by indurated substrates and generally efficient drainage, resulting in limited, localised wetland expression. Wetlands are typically restricted to drainage lines, valley floors and minor depressions, are often ephemeral and rainfall-driven, and lack the spatial extent, connectivity and groundwater dependence that typify the Swan Coastal Plain.
- **SWA02** is a wetland-rich, low-lying sandplain system, where Quaternary dune–swale geomorphology and shallow groundwater tables drive the development of widespread, diverse wetland complexes (e.g. lakes, sumplands, damplands, peat swamps and claypans). Wetlands are typically interconnected and groundwater-influenced, occurring at high frequency across

interdunal depressions and alluvial flats, and form a continuous hydrological mosaic across much of the landscape.

This is strongly evident, visually, in **Figure 3.1**; the majority of geomorphic wetlands in the RCA are located to the west, in the SWA02 subregion, with relatively many fewer wetlands within SWA01 to the east. This is especially pertinent in the Yathroo Wind Farm Project when considering potential impacts (of the Project) on wetland-dependent birds, as almost the entire proposed development footprint (and all of the proposed WTGs) is located in the (relatively) wetland-depauperate SWA01.

Nevertheless, wetlands suited to conservation significant wetland-dependent birds may occur throughout (irrespective of subregion) and, therefore, a suitability assessment was undertaken for all wetlands in the RCA.

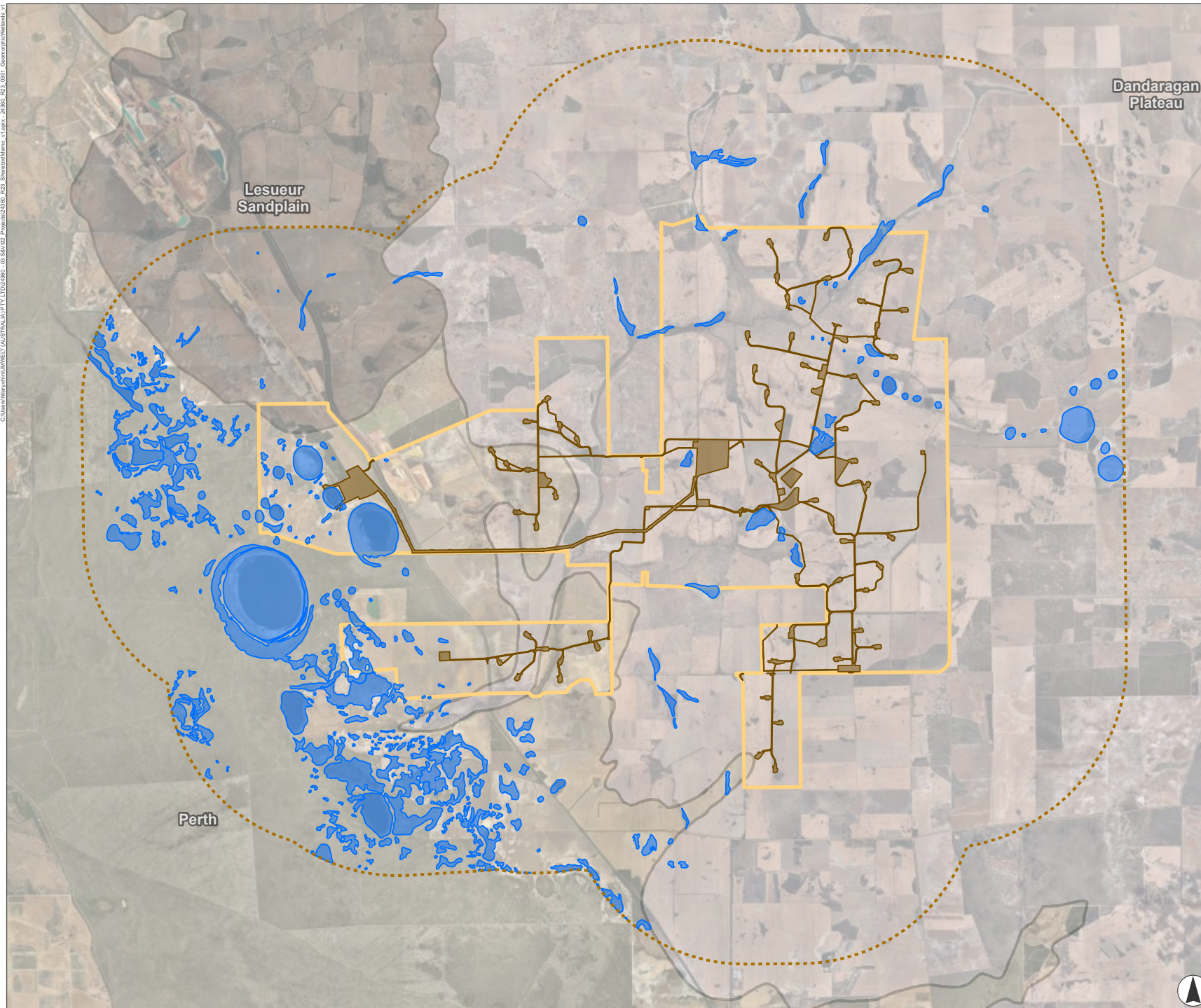


FIGURE 3.1

Geomorphic Wetlands Within the Regional Context Area Boundary

Legend

-  Project Area
-  Disturbance Footprint
-  Regional Context Area
-  Geomorphic Wetlands
- IBRA Subregions (DCCEEW 2026)**
 -  Dandaragan Plateau (SWA01)
 -  Lesueur Sandplain (GES02)
 -  Perth (SWA02)



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3.1.2.2 Wetland Suitability for Conservation Significant Shorebirds (and Allies) of Interest

Where applicable, field observations (of wetland features and wetland-dependent bird presence), database searches (conducted during desktop assessment) and the wetland characteristics provided by DBCA (2025) were used in conjunction with the group- or taxon-specific information (summarised in **Section 3.1.1**) to assess the likelihood of each of the 361 wetlands within the RCA to support one or more of the 13 shorebird (and allies) taxa outlined in **Section 3.1.1**.

Shorebird (and allies) taxa of interest are known or are considered likely to occur at 23 (6.4%) of the RCA wetlands (8 lakes, 12 sumplands and 3 damplands), of which 4 (2 lakes and 2 sumplands) are within the PA (as summarised in **Table 3.2** and mapped in **Figure 3.2**). Almost all of the higher-quality wetlands (21) occur along the western edge of the RCA/PA (in the SWA02 subregion; as noted above), with only 2 higher-quality wetlands located in the central and eastern RCA/PA (in the SWA01 subregion).

Shorebird (and allies) taxa of interest are not reasonably expected at the vast majority of geomorphic wetlands (89.2% of wetlands were considered ‘unlikely’ to support these taxa; see **Table 3.2**) primarily due to a lack of suitable habitat (surface water, mudflats etc.). The remaining 4.4% of wetlands (‘possible’, see **Table 3.2**) may occasionally provide suitable habitat for this group of taxa (as seasonal or interannual conditions change).

Table 3.2 Expected Occurrence of Shorebird (and Allies) Taxa of Interest at Wetlands Within the Regional Context Area and Project Area

Geomorphic Wetland Type	Likelihood of Supporting Shorebird (and allies) Taxa Of Interest				Total	Percentage
	Known	Likely	Possible	Unlikely		
Entire Regional Context Area						
Lake	4	4	-	2	10	2.8%
Sumpland	1	11	9	90	111	30.7%
Dampland	-	3	7	214	224	62%
Floodplain	-	-	-	5	5	1.4%
Palusplain	-	-	-	4	4	1.1%
Paluslope	-	-	-	7	7	1.9%
Total	5	18	16	322	361	100%
Percentage	1.4%	5.0%	4.4%	89.2%	100%	
Project Area Only						
Lake	1	1	-	1	3	3.9%
Sumpland	1	1	4	38	44	57.1%
Dampland	-	-	1	20	21	27.3%
Floodplain	-	-	-	1	1	1.3%
Palusplain	-	-	-	4	4	5.2%
Paluslope	-	-	-	4	4	5.2%
Total	2	2	5	68	77	100%
Percentage	2.6%	2.6%	6.5%	88.3%	100%	

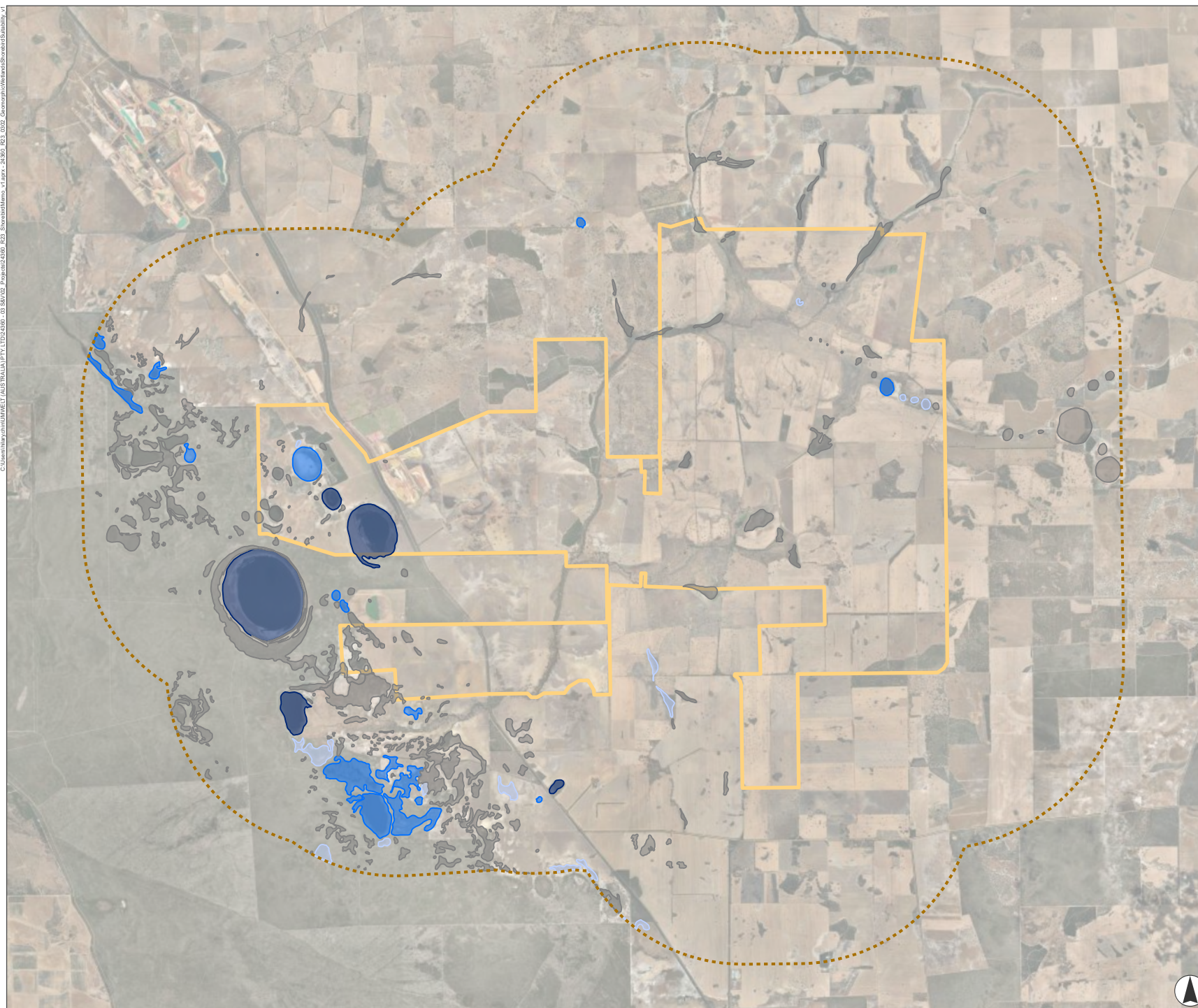


FIGURE 3.2

Expected Occurrence of Shorebird (and allies) Taxa of Interest at Wetlands Within the Regional Context Area

Legend

-  Project Area
-  Regional Context Area

Migratory Shorebird Suitability

-  Known
-  Likely
-  Possible
-  Unlikely



Scale 1:150,000 at A4
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3.1.2.3 Wetland Suitability for Blue-billed Duck

The Blue-billed Duck is known or is considered likely to occur at 18 (5.0%) of the RCA wetlands (6 lakes, 9 sumplands and 3 damplands), of which 4 (2 lakes and 2 sumplands) are within the PA (as summarised in **Table 3.3** and mapped in **Figure 3.3**). Almost all of the higher-quality wetlands (15) occur along the western edge of the RCA/PA (in the SWA02 subregion; as noted above), with only 3 higher-quality wetlands located in the central and eastern RCA/PA (in the SWA01 subregion).

The Blue-billed Duck is not reasonably expected at the vast majority of geomorphic wetlands (91.1% of wetlands were considered 'unlikely' to support these taxa; see **Table 3.3**) primarily due to a lack of suitable habitat (deep water). The remaining 3.9% of wetlands ('possible', see **Table 3.3**) may occasionally provide suitable habitat for this taxon (as seasonal or interannual conditions change).

Table 3.3 Expected Occurrence of Blue-billed Duck at Wetlands Within the Regional Context Area and Project Area

Geomorphic Wetland Type	Likelihood of Supporting Blue-billed Duck				Total	Percentage
	Known	Likely	Possible	Unlikely		
Entire Regional Context Area						
Lake	2	4	2	2	10	2.8%
Sumpland	-	9	9	93	111	30.7%
Dampland	-	3	3	218	224	62%
Floodplain	-	-	-	5	5	1.4%
Palusplain	-	-	-	4	4	1.1%
Paluslope	-	-	-	7	7	1.9%
Total	2	16	14	329	361	100%
Percentage	0.6%	4.4%	3.9%	91.1%	100%	
Project Area Only						
Lake	2	-	-	1	3	3.9%
Sumpland	-	2	4	38	44	57.1%
Dampland	-	-	-	21	21	27.3%
Floodplain	-	-	-	1	1	1.3%
Palusplain	-	-	-	4	4	5.2%
Paluslope	-	-	-	4	4	5.2%
Total	2	2	4	69	77	100%
Percentage	2.6%	2.6%	5.2%	89.6%	100%	

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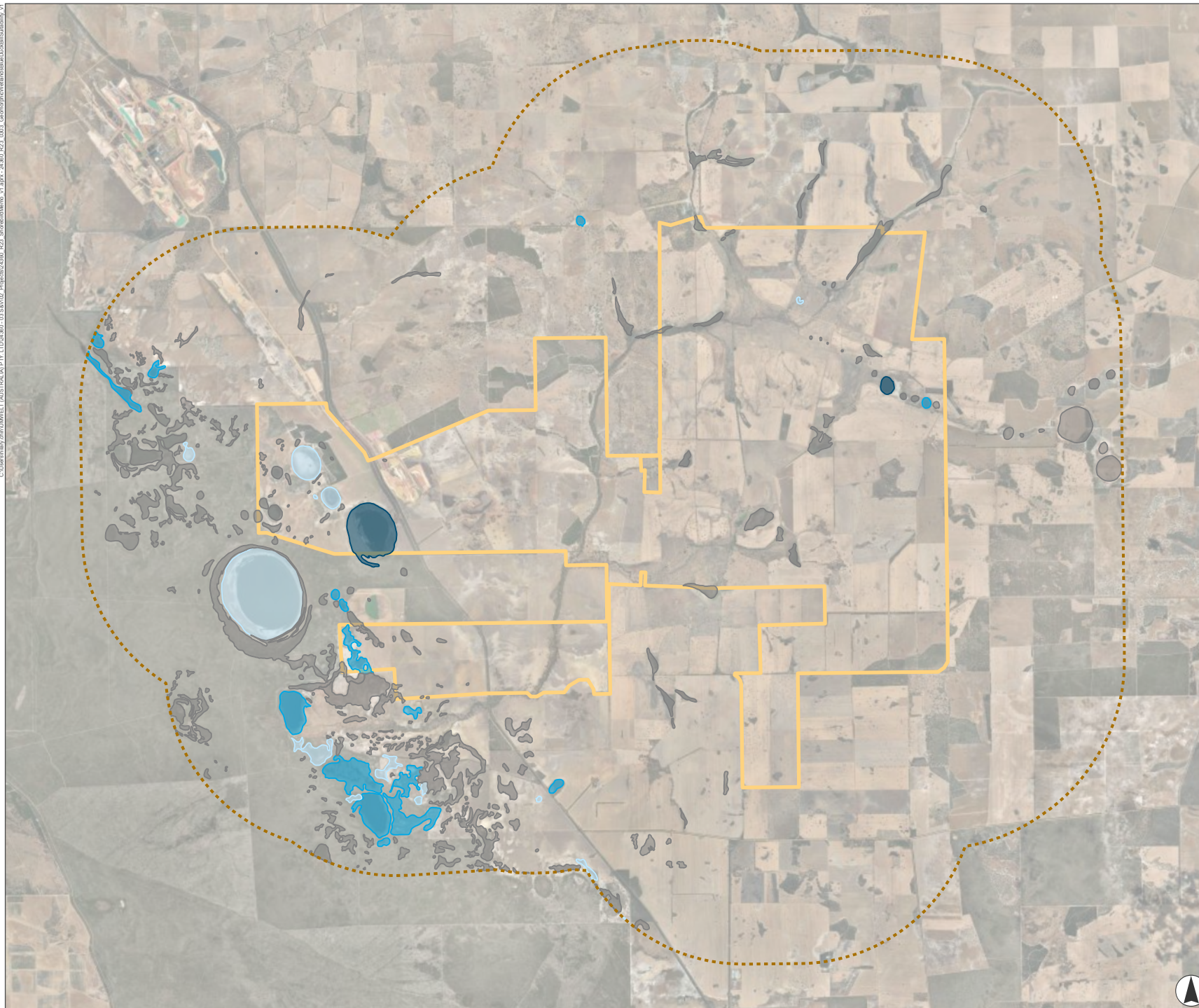


FIGURE 3.3

Expected Occurrence of Blue-billed Duck at Wetlands Within the Regional Context Area

Legend

- Project Area
- Regional Context Area

Blue-billed Duck Suitability

- Known
- Likely
- Possible
- Unlikely



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3.1.2.4 Wetland Suitability for Osprey

The Osprey is expected to have a low likelihood of occurring within the RCA/PA (as a vagrant or, at most, an irregular visitor) and, as such, a formal habitat assessment was not undertaken here. If ever present, this taxon may overfly any of the site but is probably most likely to be associated with the western wetland chain within the SWA02 bioregion (as has been highlighted for the shorebirds and duck, above). It is not considered that the Project will impact on this taxon.

3.1.3 Summary

- There are 15 focal taxa of conservation significant wetland-dependent birds (as highlighted by previous desktop assessment, field studies and/or of particular interest to DCCEEW) that may occur within the Project Area and/or Regional Context Area (a 5 km buffer around the PA).
- The 15 taxa of interest are each listed as Migratory and/or Threatened under the EPBC Act and/or BC Act, and/or are listed as a priority taxon by DBCA.
- Food availability and foraging behaviours are major drivers in the occurrence and distribution of wetland-dependent birds and, therefore, the 15 taxa of interest have been grouped by feeding ecology for the purposes of habitat assessment.
- There are 361 wetlands in six geomorphic wetland categories within the RCA: ten lakes, 111 sumplands, 224 damplands, five floodplains, four palusplains and seven paluslopes.
- Wetland types within the PA are similarly represented in the RCA, and similar ecological functions are expected to be provided for conservation significant wetland-dependent birds within and outside of the PA.
- The PA and RCA are at the interface of three IBRA subregions: SWA01 (Dandaragan Plateau), SWA02 (Perth) and GES02 (Lesueur Sandplains) and this markedly affects the spatial prevalence and type of surface wetlands present.
- The majority of wetlands in the RCA are located to the west, in the SWA02 subregion, with relatively many fewer wetlands within SWA01 to the east.
- Wetlands suited to conservation significant wetland-dependent birds may occur throughout.
- Shorebird (and allies) taxa of interest are not reasonably expected at the vast majority of wetlands in the RCA, with these taxa known or likely to occur at only 23 (6.4%) wetlands (8 lakes, 12 sumplands, and 3 damplands).
- The Blue-billed Duck is not reasonably expected at the vast majority of wetlands in the RCA, with this taxon known or likely to occur at only 18 (5.0%) wetlands (6 lakes, 9 sumplands, and 3 damplands).
- Habitat for the Osprey was not assessed here due to the low-likelihood of its occurrence within the RCA.
- The most likely wetlands for shorebird (and allies) taxa of interest and Blue-billed Duck are mainly located in the SWA02 subregion in the west of the RCA/PA, and it is noted that almost the entire proposed development footprint (and all of the proposed WTGs) is situated in the (relatively) wetland-depauperate SWA01 subregion to the east.
- Given the spatial patterns in availability of higher-quality suitable wetland habitat for the 15 conservation significant wetland-dependent bird taxa of interest and the proposed siting of the

Yathroo Wind Farm, it is expected that interactions between these taxa and infrastructure and/or construction/operation activity are likely to be greatly minimised.

Potential mechanisms for interactions or impact are discussed in the Synthesis in **Section 4.0**.

3.2 Wetland-dependent Bird Surveys

3.2.1 Recorded Assemblage

A total of 47 wetland-dependent bird taxa have been recorded in the 96 surveys at the 11 wetlands assessed. A list of these taxa, the number of surveys in which each was recorded and the total count (from all surveys) is presented in **Table 3.4**. Of these, 9 are of conservation significance; comprising 8 shorebird taxa that are listed under the EPBC and/or BC Acts, and 1 waterfowl taxon (Blue-billed Duck) ranked as a priority species by DBCA (as indicated in **Table 3.4**). The remaining taxa are likely to either be local residents and/or undertake regional movements in response to seasonal conditions (but not defined 'migration').

The most regularly recorded (across all wetlands) taxa were: Grey Teal, Australian Shelduck, Pacific Black Duck, Hoary-headed Grebe, Pied Stilt, Eurasian Coot, Australasian Grebe and Australasian Shoveler (all recorded in more than one-third of the surveys). The most numerous taxa (across all wetlands and all surveys) were: Grey Teal, Australian Shelduck, Black Swan, Pink-eared Duck and Eurasian Coot (which, combined, account for more than 80% of all birds counted). These results reflect taxa that are generally widespread and abundant in south-western Western Australia and the types of wetland environments available within the Survey Area (see **Section 3.1**). Most of the 'dominant' taxa are waterfowl (see **Section 2.3**) that are typically 'common' in the region (Storey et al., 1993). While there is some overlap between the lists of most-recorded and most-abundant taxa, some are disproportionately abundant for the number of surveys in which they were recorded (e.g. Black Swan and Pink-eared Duck). This is, however, also typical of the ecology of these taxa (that tend to congregate locally in large numbers).

The maximum single-day count (across all wetlands surveyed on the same day) is presented for each taxon in **Table 3.5**. These data provide an indication of the maximum carrying capacity of the surveyed wetlands, as a whole, and an approximate indicator of how many individuals of each taxon that the local area may support. Taxa with the stand-out largest local populations were Grey Teal, Black Swan and Australian Shelduck (all with local populations in excess of 1,800 individuals). These are taxa that are regionally (and, for that matter, nationally) abundant (see Storey et al., 1993).

None of the taxa that were (i) most commonly recorded, (ii) most abundant overall, or (iii) had the highest local population are a conservation significant taxon.

Table 3.4 Wetland-dependent Bird Taxa Recorded

Wetland Dependency Type	Family	Scientific Name	Common Name	EPBC Listing	WA Listing	Surveys Present	Total Count
Waterfowl	Anatidae	<i>Cygnus atratus</i>	Black Swan	-	-	27	4,677
Waterfowl	Anatidae	<i>Tadorna tadornoides</i>	Australian Shelduck	-	-	48	5,375
Waterfowl	Anatidae	<i>Malacorhynchus membranaceus</i>	Pink-eared Duck	-	-	27	968
Waterfowl	Anatidae	<i>Chenonetta jubata</i>	Maned Duck	-	-	19	119
Waterfowl	Anatidae	<i>Spatula rhynchotis</i>	Australasian Shoveler	-	-	31	375
Waterfowl	Anatidae	<i>Anas superciliosa</i>	Pacific Black Duck	-	-	44	380
Waterfowl	Anatidae	<i>Anas gracilis</i>	Grey Teal	-	-	63	7,635
Waterfowl	Anatidae	<i>Anas castanea</i>	Chestnut Teal	-	-	3	6
Waterfowl	Anatidae	<i>Aythya australis</i>	Hardhead	-	-	24	163
Waterfowl	Anatidae	<i>Oxyura australis</i>	Blue-billed Duck	-	P4	13	91
Waterfowl	Anatidae	<i>Biziura lobata</i>	Musk Duck	-	-	22	106
Aquatic Waterbirds	Rallidae	<i>Tribonyx ventralis</i>	Black-tailed Nativehen	-	-	1	1
Aquatic Waterbirds	Rallidae	<i>Fulica atra</i>	Eurasian Coot	-	-	34	955
Aquatic Waterbirds	Rallidae	<i>Porphyrio porphyrio</i>	Purple Swamphen	-	-	2	2

Wetland Dependency Type	Family	Scientific Name	Common Name	EPBC Listing	WA Listing	Surveys Present	Total Count
Aquatic Waterbirds	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	-	-	32	123
Aquatic Waterbirds	Podicipedidae	<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe	-	-	36	698
Aquatic Waterbirds	Podicipedidae	<i>Tachybaptus/Poliiocephalus sp.</i>	Unidentified small grebe	-	-	2	5
Shorebirds	Recurvirostridae	<i>Himantopus leucocephalus</i>	Pied Stilt	-	-	36	658
Shorebirds	Recurvirostridae	<i>Cladorhynchus leucocephalus</i>	Banded Stilt	-	-	5	16
Shorebirds	Recurvirostridae	<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet	-	-	8	72
Shorebirds	Charadriidae	<i>Vanellus tricolor</i>	Banded Lapwing	-	-	1	1
Shorebirds	Charadriidae	<i>Erythrogonyx cinctus</i>	Red-kneed Dotterel	-	-	3	6
Shorebirds	Charadriidae	<i>Anarhynchus ruficapillus</i>	Red-capped Plover	-	-	10	168
Shorebirds	Charadriidae	<i>Thinornis melanops</i>	Black-fronted Dotterel	-	-	21	58
Shorebirds	Scolopacidae	<i>Limosa lapponica menzbieri</i>	Bar-tailed Godwit (northern Siberian)	EN & MI	CR & MI	1	3
Shorebirds	Scolopacidae	<i>Limosa limosa</i>	Black-tailed Godwit	EN & MI	MI	1	1
Shorebirds	Scolopacidae	<i>Calidris pugnax</i>	Ruff	MI	MI	1	3
Shorebirds	Scolopacidae	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	VU & MI	MI	3	16

Wetland Dependency Type	Family	Scientific Name	Common Name	EPBC Listing	WA Listing	Surveys Present	Total Count
Shorebirds	Scolopacidae	<i>Calidris ferruginea</i>	Curlew Sandpiper	CR & MI	CR	1	1
Shorebirds	Scolopacidae	<i>Calidris ruficollis</i>	Red-necked Stint	MI	MI	4	27
Shorebirds	Scolopacidae	<i>Tringa glareola</i>	Wood Sandpiper	MI	MI	2	16
Shorebirds	Scolopacidae	<i>Tringa nebularia</i>	Common Greenshank	EN & MI	MI	4	9
Wetland Associated	Laridae	<i>Chroicocephalus novaehollandiae</i>	Silver Gull	-	-	12	151
Wetland Associated	Laridae	<i>Chlidonias hybrida</i>	Whiskered Tern	-	-	2	61
Aquatic Waterbirds	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian Darter	-	-	2	3
Aquatic Waterbirds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	Little Pied Cormorant	-	-	14	31
Aquatic Waterbirds	Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	-	-	10	42
Aquatic Waterbirds	Phalacrocoracidae	<i>Phalacrocorax carbo</i>	Great Cormorant	-	-	1	1
Wading Waterbirds	Threskiornithidae	<i>Threskiornis molucca</i>	Australian White Ibis	-	-	11	50
Wading Waterbirds	Threskiornithidae	<i>Threskiornis spinicollis</i>	Straw-necked Ibis	-	-	23	424
Wading Waterbirds	Threskiornithidae	<i>Platalea flavipes</i>	Yellow-billed Spoonbill	-	-	18	111
Wading Waterbirds	Ardeidae	<i>Ardea pacifica</i>	White-necked Heron	-	-	8	68
Wading Waterbirds	Ardeidae	<i>Ardea alba</i>	Great Egret	-	-	5	11

Wetland Dependency Type	Family	Scientific Name	Common Name	EPBC Listing	WA Listing	Surveys Present	Total Count
Wading Waterbirds	Ardeidae	<i>Egretta novaehollandiae</i>	White-faced Heron	-	-	27	82
Aquatic Waterbirds	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian Pelican	-	-	15	73
Wetland Associated	Accipitridae	<i>Circus approximans</i>	Swamp Harrier	-	-	6	8
Wetland Associated	Accipitridae	<i>Haliastur sphenurus</i>	Whistling Kite	-	-	11	12
Wetland Associated	Acrocephalidae	<i>Acrocephalus australis</i>	Australian Reed Warbler	-	-	2	2

Table 3.5 Maximum Single-day Counts of Wetland-dependent Bird Taxa within the Survey Area (all Wetlands Pooled)

Scientific Name	Common Name	Maximum Single-day Count
<i>Cygnus atratus</i>	Black Swan	2000
<i>Tadorna tadornoides</i>	Australian Shelduck	1870
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck	229
<i>Chenonetta jubata</i>	Maned Duck	26
<i>Spatula rhynchotis</i>	Australasian Shoveler	220
<i>Anas superciliosa</i>	Pacific Black Duck	48
<i>Anas gracilis</i>	Grey Teal	3430
<i>Anas castanea</i>	Chestnut Teal	4
<i>Aythya australis</i>	Hardhead	30
<i>Oxyura australis</i>	Blue-billed Duck	23
<i>Biziura lobata</i>	Musk Duck	38
<i>Tribonyx ventralis</i>	Black-tailed Nativehen	1
<i>Fulica atra</i>	Eurasian Coot	203
<i>Porphyrio porphyrio</i>	Purple Swamphen	1
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	13
<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe	152
<i>Tachybaptus/Poliiocephalus sp.</i>	Unidentified small grebe	3
<i>Himantopus leucocephalus</i>	Pied Stilt	160
<i>Cladorhynchus leucocephalus</i>	Banded Stilt	7
<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet	47
<i>Vanellus tricolor</i>	Banded Lapwing	NA
<i>Erythronyx cinctus</i>	Red-kneed Dotterel	3
<i>Anarhynchus ruficapillus</i>	Red-capped Plover	48
<i>Thinornis melanops</i>	Black-fronted Dotterel	11
<i>Limosa lapponica menzbieri</i>	Bar-tailed Godwit (northern Siberian)	3
<i>Limosa limosa</i>	Black-tailed Godwit	1
<i>Calidris pugnax</i>	Ruff	3
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	8
<i>Calidris ferruginea</i>	Curlew Sandpiper	1
<i>Calidris ruficollis</i>	Red-necked Stint	12

Scientific Name	Common Name	Maximum Single-day Count
<i>Tringa glareola</i>	Wood Sandpiper	15
<i>Tringa nebularia</i>	Common Greenshank	6
<i>Chroicocephalus novaehollandiae</i>	Silver Gull	40
<i>Chlidonias hybrida</i>	Whiskered Tern	60
<i>Anhinga novaehollandiae</i>	Australasian Darter	2
<i>Microcarbo melanoleucos</i>	Little Pied Cormorant	10
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	20
<i>Phalacrocorax carbo</i>	Great Cormorant	1
<i>Threskiornis molucca</i>	Australian White Ibis	19
<i>Threskiornis spinicollis</i>	Straw-necked Ibis	202
<i>Platalea flavipes</i>	Yellow-billed Spoonbill	38
<i>Ardea pacifica</i>	White-necked Heron	47
<i>Ardea alba</i>	Great Egret	6
<i>Egretta novaehollandiae</i>	White-faced Heron	17
<i>Pelecanus conspicillatus</i>	Australian Pelican	18
<i>Circus approximans</i>	Swamp Harrier	3
<i>Haliastur sphenurus</i>	Whistling Kite	2
<i>Acrocephalus australis</i>	Australian Reed Warbler	NA

NA indicates a taxon had been recorded but no count was made (i.e. presence only).

3.2.2 Wetland Use (Spatial Patterns)

The number (and proportion) of surveys in which each wetland-dependent bird taxon was recorded at each wetland is presented in **Table 3.6**. Even allowing for the variation in surveys at each site (from 6 to 14 surveys), there is enormous variation in the number of wetland-dependent bird taxa recorded at each wetland. Species richness ranged from 1 (at wetland WE-06) to 37 (at wetland WE-C2), as indicated in **Table 3.6**. This range reflects the considerable variation in physical wetland parameters (e.g. size, water depth, water permanency, water quality, mudflat presence, fringing or overhanging vegetation, degradation; some of which are outlined for each wetland in **Table 2.5**) and, therefore, the resources and habitat features afforded to wetland-dependent birds.

There are some well-established general relationships between physical parameters and wetland-dependent bird diversity (Barratt Heitmann et al., 2025; Kingsford et al., 2020; Marin-Estrella et al., 2021; Pearson et al., 2024). Increased species richness (and, in many cases, greater abundance) are positively correlated with:

- Wetland size
- Water depth (to a point)
- Connectivity to surrounding habitat
- Water ‘health’
- Decreased disturbance levels
- Temporal hydrology

With that in mind, however, a smaller, structurally diverse wetland can outperform (in terms of biodiversity) a larger, homogeneous one.

For the Survey Area, wetlands such as WE-02, WE-C1 and WE-C2 are larger and generally provide more complex habitat that, therefore, suits a range of the wetland-dependent bird categories (as noted in **Section 2.3**) with differing ecological requirements and roles. As a result, these sites were more biodiverse than the other wetlands surveyed (in terms of ‘raw’ species richness, see **Table 3.6**). Conversely, simple, highly ephemeral, and/or highly disturbed sites, such as WE-06, WE-08 and WE-C4, appear less able to support a diversity of taxa.

The total counts of each taxon at each wetland (all surveys’ data pooled) are presented in **Table 3.7**. Note that values are total pooled values and do not standardise for varied survey effort at each wetland. Thus, comparisons between wetlands should be made based on proportional representation and not absolute count. As for presence (above), the proportion of all birds counted that any given taxon represents varies dramatically between wetlands (e.g. Grey Teal ranges from absent, at WE-C4, to 100% of all birds counted, at WE-06). These variations reflect the wetland attributes (noted above) and the foraging strategy (see **Section 2.3**) of the taxon and will be different for each of the taxa recorded. Further analysis of these relationships, in the general sense, is not warranted for this assessment but is explored for conservation significant taxa of interest in **Section 3.2.4**.

Overall, the field investigations have shown that wetland-dependent birds were concentrated on wetlands to the west of the Survey Area that very strongly mirrors the trends drawn out by the habitat analysis (**Section 3.1.2**); with the number and expected quality of wetlands higher in the SWA02 IBRA subregion located here. The obvious stand-out to this ‘general’ trend is WE-02 (Lake Yangy) located to the east of the PA; this wetland has a diverse and numerous wetland-dependent bird assemblage.

Table 3.6 The Number of Surveys per Wetland in which each Taxon was Recorded

Common Name	WE-01	WE-02	WE-04	WE-05	WE-06	WE-07	WE-08	WE-C1	WE-C2	WE-C3	WE-C4	Total
Total Surveys	12	14	6	7	7	7	6	11	12	7	9	6
Black Swan	2 (16.7%)	8 (57.1%)	1 (16.7%)	-	-	1 (14.3%)	-	2 (18.2%)	12 (100%)	1 (14.3%)	-	27 (28.1%)
Australian Shelduck	11 (91.7%)	14 (100%)	6 (100%)	-	-	-	2 (33.3%)	2 (18.2%)	11 (91.7%)	2 (28.6%)	-	48 (50.0%)
Pink-eared Duck	9 (75%)	11 (78.6%)	3 (50%)	-	-	1 (14.3%)	-	-	3 (25.0%)	-	-	27 (28.1%)
Maned Duck	7 (58.3%)	7 (50%)	4 (66.7%)	-	-	-	-	-	1 (8.3%)	-	-	19 (19.8%)
Australasian Shoveler	10 (83.3%)	11 (78.6%)	4 (66.7%)	-	-	1 (14.3%)	-	1 (9.1%)	4 (33.3%)	-	-	31 (32.3%)
Pacific Black Duck	10 (83.3%)	6 (42.9%)	6 (100%)	-	-	3 (42.9%)	1 (16.7%)	8 (72.7%)	6 (50.0%)	3 (42.9%)	1 (14.3%)	44 (45.8%)
Grey Teal	12 (100%)	14 (100%)	6 (100%)	3 (42.9%)	1 (14.3%)	3 (42.9%)	5 (83.3%)	5 (45.5%)	11 (91.7%)	3 (42.9%)	-	63 (65.6%)
Chestnut Teal	3 (25%)	-	-	-	-	-	-	-	-	-	-	3 (3.1%)
Hardhead	8 (66.7%)	10 (71.4%)	-	-	-	1 (14.3%)	-	3 (27.3%)	2 (16.7%)	-	-	24 (25.0%)
Blue-billed Duck	-	11 (78.6%)	-	-	-	-	-	-	2 (16.7%)	-	-	13 (13.5%)
Musk Duck	1 (8.3%)	7 (50%)	-	-	-	-	-	4 (36.4%)	10 (83.3%)	-	-	22 (22.9%)

Common Name	WE-01	WE-02	WE-04	WE-05	WE-06	WE-07	WE-08	WE-C1	WE-C2	WE-C3	WE-C4	Total
Black-tailed Nativehen	-	-	-	-	-	-	-	1 (9.1%)	-	-	-	1 (1.0%)
Eurasian Coot	10 (83.3%)	9 (64.3%)	-	1 (14.3%)	-	3 (42.9%)	-	5 (45.5%)	6 (50%)	-	-	34 (35.4%)
Purple Swamphen	-	-	-	-	-	-	-	2 (18.2%)	-	-	-	2 (2.1%)
Australasian Grebe	12 (100%)	6 (42.9%)	5 (83.3%)	-	-	-	-	4 (36.4%)	4 (33.3%)	1 (14.3%)	-	32 (33.3%)
Hoary-headed Grebe	7 (58.3%)	12 (85.7%)	5 (83.3%)	1 (14.3%)	-	2 (28.6%)	-	3 (27.3%)	5 (41.7%)	1 (14.3%)	-	36 (37.5%)
Unidentified small grebe				-	-	-	-	-	2 (16.7%)	-	-	2 (2.1%)
Pied Stilt	5 (41.7%)	12 (85.7%)	2 (33.3%)	1 (14.3%)	-	1 (14.3%)	2 (33.3%)	2 (18.2%)	10 (83.3%)	1 (14.3%)	-	36 (37.5%)
Banded Stilt	-	-	-	-	-	-	-	-	5 (41.7%)	-	-	5 (5.2%)
Red-necked Avocet	-	5 (35.7%)	-	-	-	-	-	-	3 (25.0%)	-	-	8 (8.3%)
Banded Lapwing	-	-	-	-	-	-	-	-	-	1 (14.3%)	-	1 (1.0%)
Red-kneed Dotterel	-	2 (14.3%)	-	-	-	-	-	1 (9.1%)	-	-	-	3 (3.1%)
Red-capped Plover	-	4 (28.6%)	-	-	-	-	-	-	6 (50.0%)	-	-	10 (10.4%)
Black-fronted Dotterel	8 (66.7%)	6 (42.9%)	-	-	-	1 (14.3%)	1 (16.7%)	3 (27.3%)	1 (8.3%)	1 (14.3%)	-	21 (21.9%)

Common Name	WE-01	WE-02	WE-04	WE-05	WE-06	WE-07	WE-08	WE-C1	WE-C2	WE-C3	WE-C4	Total
Bar-tailed Godwit (northern Siberian)	-	-	-	-	-	-	-	-	1 (8.3%)	-	-	1 (1.0%)
Black-tailed Godwit	-	-	-	-	-	-	-	-	1 (8.3%)	-	-	1 (1.0%)
Ruff	-	-	-	-	-	-	-	-	1 (8.3%)	-	-	1 (1.0%)
Sharp-tailed Sandpiper	-	-	-	-	-	-	-	-	3 (25%)	-	-	3 (3.1%)
Curlew Sandpiper	-	-	-	-	-	-	-	-	1 (8.3%)	-	-	1 (1.0%)
Red-necked Stint	-	-	-	-	-	-	-	-	4 (33.3%)	-	-	4 (4.2%)
Wood Sandpiper	-	-	-	-	-	-	-	2 (18.2%)	-	-	-	2 (2.1%)
Common Greenshank	-	-	-	-	-	-	-	2 (18.2%)	2 (16.7%)	-	-	4 (4.2%)
Silver Gull	-	1 (7.1%)	-	-	-	-	-	-	11 (91.7%)	-	-	12 (12.5%)
Whiskered Tern	-	-	-	-	-	-	-	-	1 (8.3%)	1 (14.3%)	-	2 (2.1%)
Australasian Darter	-	1 (7.1%)	1 (16.7%)	-	-	-	-	-	-	-	-	2 (2.1%)
Little Pied Cormorant	2 (16.7%)	1 (7.1%)	2 (33.3%)	-	-	-	-	3 (27.3%)	5 (41.7%)	1 (14.3%)	-	14 (14.6%)
Little Black Cormorant	-	2 (14.3%)	2 (33.3%)	-	-	-	-	4 (36.4%)	1 (8.3%)	1 (14.3%)	-	10 (10.4%)

Common Name	WE-01	WE-02	WE-04	WE-05	WE-06	WE-07	WE-08	WE-C1	WE-C2	WE-C3	WE-C4	Total
Great Cormorant	-	-	1 (16.7%)	-	-	-	-	-	-	-	-	1 (1.0%)
Australian White Ibis	2 (16.7%)	-	2 (33.3%)	-	-	-	-	2 (18.2%)	4 (33.3%)	1 (14.3%)	-	11 (11.5%)
Straw-necked Ibis	3 (25%)	5 (35.7%)	2 (33.3%)	-	-	-	1 (16.7%)	5 (45.5%)	6 (50%)	1 (14.3%)	-	23 (24.0%)
Yellow-billed Spoonbill	2 (16.7%)	2 (14.3%)	3 (50%)	1 (14.3%)	-	-	-	3 (27.3%)	6 (50%)	1 (14.3%)	-	18 (18.8%)
White-necked Heron	-	1 (7.1%)	2 (33.3%)	1 (14.3%)	-	2 (28.6%)	-	-	-	2 (28.6%)	-	8 (8.3%)
Great Egret	-	1 (7.1%)	-	-	-	-	-	2 (18.2%)	1 (8.3%)	1 (14.3%)	-	5 (5.2%)
White-faced Heron	1 (8.3%)	3 (21.4%)	5 (83.3%)	-	-	1 (14.3%)	-	5 (45.5%)	8 (66.7%)	3 (42.9%)	1 (14.3%)	27 (28.1%)
Australian Pelican	-	3 (21.4%)	-	-	-	-	-	3 (27.3%)	8 (66.7%)	1 (14.3%)	-	15 (15.6%)
Swamp Harrier	-	-	-	-	-	-	-	4 (36.4%)	2 (16.7%)	-	-	6 (6.2%)
Whistling Kite	2 (16.7%)	1 (7.1%)	-	-	-	-	-	4 (36.4%)	4 (33.3%)	-	-	11 (11.5%)
Australian Reed Warbler	-	-	-	-	-	-	-	2 (18.2%)	-	-	-	2 (2.1%)
Species Richness	21	29	19	6	1	12	6	28	37	19	2	47

Table 3.7 Total Count Per Taxon Per Wetland (All Surveys Pooled)

Common Name	WE-01	WE-02	WE-04	WE-05	WE-06	WE-07	WE-08	WE-C1	WE-C2	WE-C3	WE-C4	Total Count
Total Abundance	1,686	6,260	500	31	50	376	96	369	14,068	421	4	23,861
Black Swan	4 (0.2%)	39 (0.6%)	1 (0.2%)	-	-	1 (0.3%)	-	4 (1.1%)	4598 (32.7%)	30 (7.1%)	-	4,677 (19.6%)
Australian Shelduck	237 (14.1%)	2862 (45.7%)	94 (18.8%)	-	-	-	22 (22.9%)	5 (1.4%)	2138 (15.2%)	17 (4.0%)	-	5,375 (22.5%)
Pink-eared Duck	89 (5.3%)	834 (13.3%)	6 (1.2%)	-	-	15 (4%)	-	-	24 (0.2%)	-	-	968 (4.1%)
Maned Duck	47 (2.8%)	25 (0.4%)	44 (8.8%)	-	-	-	-	-	3 (0.1%)	-	-	119 (0.5%)
Australasian Shoveler	56 (3.3%)	62 (1.0%)	12 (2.4%)	-	-	1 (0.3%)	-	2 (0.5%)	242 (1.7%)	-	-	375 (1.6%)
Pacific Black Duck	96 (5.7%)	45 (0.7%)	61 (12.2%)	-	-	49 (13.0%)	6 (6.2%)	30 (8.1%)	84 (0.6%)	8 (1.9%)	1 (25%)	380 (1.6%)
Grey Teal	738 (43.8%)	1064 (17.0%)	158 (31.6%)	20 (64.5%)	50 (100%)	252 (67.0%)	60 (62.5%)	18 (4.9%)	5246 (37.3%)	29 (6.9%)	-	7635 (32%)
Chestnut Teal	6 (0.4%)	-	-	-	-	-	-	-	-	-	-	6 (0.1%)
Hardhead	50 (3.0%)	49 (0.8%)	-	-	-	30 (8.0%)	-	5 (1.4%)	29 (0.2%)	-	-	163 (0.7%)
Blue-billed Duck	-	87 (1.4%)	-	-	-	-	-	-	4 (0.1%)	-	-	91 (0.4%)
Musk Duck	1 (0.1%)	17 (0.3%)	-	-	-	-	-	4 (1.1%)	84 (0.6%)	-	-	106 (0.4%)

Common Name	WE-01	WE-02	WE-04	WE-05	WE-06	WE-07	WE-08	WE-C1	WE-C2	WE-C3	WE-C4	Total Count
Black-tailed Nativehen	-	-	-	-	-	-	-	1 (0.3%)	-	-	-	1 (0.1%)
Eurasian Coot	132 (7.8%)	243 (3.9%)	-	2 (6.5%)	-	21 (5.6%)	-	20 (5.4%)	537 (3.8%)	-	-	955 (4%)
Purple Swamphen	-	-	-	-	-	-	-	2 (0.5%)	-	-	-	2 (0.1%)
Australasian Grebe	81 (4.8%)	27 (0.4%)	10 (2.0%)	-	-	-	-	3 (0.8%)	1 (0.1%)	1 (0.2%)	-	123 (0.5%)
Hoary-headed Grebe	21 (1.2%)	593 (9.5%)	8 (1.6%)	1 (3.2%)	-	2 (0.5%)	-	13 (3.5%)	40 (0.3%)	20 (4.8%)	-	698 (2.9%)
Unidentified small grebe	-	-	-	-	-	-	-	-	5 (0.1%)	-	-	5 (0.1%)
Pied Stilt	26 (1.5%)	118 (1.9%)	7 (1.4%)	3 (9.7%)	-	1 (0.3%)	5 (5.2%)	8 (2.2%)	380 (2.7%)	110 (26.1%)	-	658 (2.8%)
Banded Stilt	-	-	-	-	-	-	-	-	16 (0.1%)	-	-	16 (0.1%)
Red-necked Avocet	-	66 (1.1%)	-	-	-	-	-	-	6 (0%)	-	-	72 (0.3%)
Banded Lapwing	-	-	-	-	-	-	-	-	-	NA	-	NA
Red-kneed Dotterel	-	3 (0.1%)	-	-	-	-	-	3 (0.8%)	-	-	-	6 (0.1%)
Red-capped Plover	-	18 (0.3%)	-	-	-	-	-	-	150 (1.1%)	-	-	168 (0.7%)
Black-fronted Dotterel	16 (0.9%)	19 (0.3%)	-	-	-	1 (0.3%)	2 (2.1%)	14 (3.8%)	2 (0.1%)	4 (1.0%)	-	58 (0.2%)

Common Name	WE-01	WE-02	WE-04	WE-05	WE-06	WE-07	WE-08	WE-C1	WE-C2	WE-C3	WE-C4	Total Count
Bar-tailed Godwit (northern Siberian)	-	-	-	-	-	-	-	-	3 (0.1%)	-	-	3 (0.1%)
Black-tailed Godwit	-	-	-	-	-	-	-	-	1 (0.1%)	-	-	1 (0.1%)
Ruff	-	-	-	-	-	-	-	-	3 (0.1%)	-	-	3 (0.1%)
Sharp-tailed Sandpiper	-	-	-	-	-	-	-	-	16 (0.1%)	-	-	16 (0.1%)
Curlew Sandpiper	-	-	-	-	-	-	-	-	1 (0.1%)	-	-	1 (0.1%)
Red-necked Stint	-	-	-	-	-	-	-	-	27 (0.2%)	-	-	27 (0.1%)
Wood Sandpiper	-	-	-	-	-	-	-	16 (4.3%)	-	-	-	16 (0.1%)
Common Greenshank	-	-	-	-	-	-	-	7 (1.9%)	2 (0.1%)	-	-	9 (0.1%)
Silver Gull	-	1 (0.1%)	-	-	-	-	-	-	150 (1.1%)	-	-	151 (0.6%)
Whiskered Tern	-	-	-	-	-	-	-	-	1 (0.1%)	60 (14.3%)	-	61 (0.3%)
Australasian Darter	-	1 (0.1%)	2 (0.4%)	-	-	-	-	-	-	-	-	3 (0.1%)
Little Pied Cormorant	2 (0.1%)	1 (0.1%)	2 (0.4%)	-	-	-	-	5 (1.4%)	11 (0.1%)	10 (2.4%)	-	31 (0.1%)
Little Black Cormorant		1 (0.1%)	12 (2.4%)	-	-	-	-	7 (1.9%)	2 (0.1%)	20 (4.8%)	-	42 (0.2%)

Common Name	WE-01	WE-02	WE-04	WE-05	WE-06	WE-07	WE-08	WE-C1	WE-C2	WE-C3	WE-C4	Total Count
Great Cormorant	-	-	1 (0.2%)	-	-	-	-	-	-	-	-	1 (0.1%)
Australian White Ibis	4 (0.2%)	-	4 (0.8%)	-	-	-	-	10 (2.7%)	22 (0.2%)	10 (2.4%)	-	50 (0.2%)
Straw-necked Ibis	73 (4.3%)	55 (0.9%)	32 (6.4%)	-	-	-	1 (1.0%)	139 (37.7%)	94 (0.7%)	30 (7.1%)	-	424 (1.8%)
Yellow-billed Spoonbill	2 (0.1%)	3 (0.1%)	4 (0.8%)	3 (9.7%)	-	-	-	12 (3.3%)	77 (0.5%)	10 (2.4%)	-	111 (0.5%)
White-necked Heron	-	1 (0.1%)	9 (1.8%)	2 (6.5%)	-	2 (0.5%)	-	-	-	54 (12.8%)	-	68 (0.3%)
Great Egret	-	2 (0.1%)	-	-	-	-	-	7 (1.9%)	1 (0.1%)	1 (0.2%)	-	11 (0.1%)
White-faced Heron	2 (0.1%)	9 (0.1%)	33 (6.6%)	-	-	1 (0.3%)	-	14 (3.8%)	17 (0.1%)	3 (0.7%)	3 (75%)	82 (0.3%)
Australian Pelican	-	14 (0.2%)	-	-	-	-	-	11 (3.0%)	44 (0.3%)	4 (1.0%)	-	73 (0.3%)
Swamp Harrier	-	-	-	-	-	-	-	5 (1.4%)	3 (0.1%)	-	-	8 (0.1%)
Whistling Kite	3 (0.2%)	1 (0.1%)	-	-	-	-	-	4 (1.1%)	4 (0.1%)	-	-	12 (0.1%)
Australian Reed Warbler	-	-	-	-	-	-	-	NA	-	-	-	NA

NA indicates a taxon had been recorded but no count was made (i.e. presence only).

3.2.3 Seasonality (Temporal Patterns)

A plot of the total count of wetland-dependent birds in each survey period is presented in **Figure 3.4**. A strong temporal pattern was observed in the data; the Survey Area was most frequented by wetland-dependent birds in the later-summer months, with many fewer birds recorded in the winter and spring period. While no statistical correlation (or regression) was undertaken here, it is almost certain that this pattern reflects a behavioural response to rainfall. In the winter and early spring, following seasonal rains, most wetland-dependent birds are likely to have moved away from the surveyed wetlands to breed (or at least forage) at ephemeral wetlands elsewhere (possibly including non-surveyed temporary wetlands within the Survey Area itself). The peaks of numbers in late summer were concentrated on surveyed wetlands that still retained water at this time of year (e.g. WE-C2, WE-02; see **Figure 3.4**) as these sites provide refuge at a time of year when many other ephemeral wetlands are dry. In addition, some wetlands were noted to be of particular value to wetland-dependent birds as water levels began to recede in the later spring and early summer (e.g. WE-C3 in BBUS05, see **Figure 3.4**). The drying systems exposed mudflats, islands and also provided shallow water areas that were highly desired by some taxa (e.g. Wading Waterbirds, terns).

In some cases and in some parts of Australia (including south-western Western Australia), the abundance of wetland-dependent bird numbers may be inflated in the austral summer by the arrival of migrant taxa (i.e. shorebirds) for their non-breeding period. Given the relatively low abundance of these taxa within the Survey Area (see **Section 3.2.1**), however, this does not appear to be the case in the Survey Area.

The temporal patterns observed in wetland-dependent bird abundances within the Survey Area (a geographical ‘spreading out’ of birds during the winter and spring, and contraction to permanent or near-permanent wetlands in later summer) are typical of that that would be expected in south-western Western Australia (Bino et al., 2015; Roshier et al., 2002).

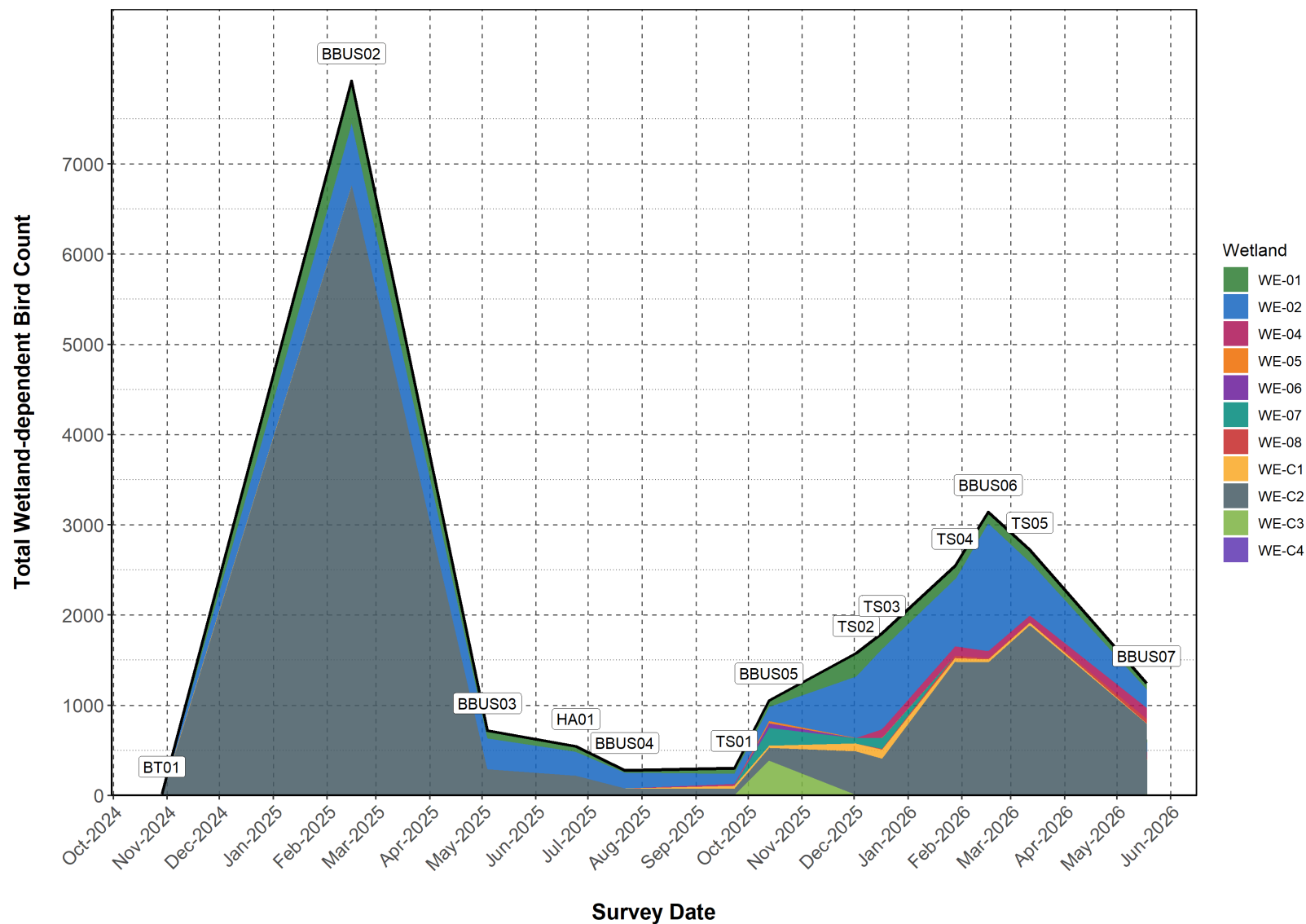


Figure 3.4 Total Wetland-dependent Bird Counts in Each Survey

3.2.4 Conservation Significant Wetland-dependent Bird Taxa

A summary of the fifteen focal taxa of conservation significant wetland-dependent birds, their current listing under federal and state legislation (including priority rankings), the number of records (and dates on which they were recorded), the maximum single wetland count and maximum same-day count (all wetlands pooled), and the wetlands on which they were recorded is presented in **Table 3.8**. Nine taxa have been recorded from the Project Area on a total of 30 occasions, with details of each record of these taxa provided in **Appendix C**.

Three adjustments to likelihood of occurrence have been made since previous assessments by Umwelt (2025d, 2025e): Australian Painted Snipe has been raised to 'Low' likelihood (from 'Excluded'), Bar-tailed Godwit has been raised to 'Known' (from 'Low') and Curlew Sandpiper has been raised to 'Known' (from 'High').

Brief commentary on the occurrence, site significance and collision risk is presented for each of the taxa in **Table 3.9**.

While the PA supports multiple taxa of conservation significant wetland-dependent birds the field studies undertaken for the Project indicate that occurrence is generally sporadic and abundances are very low. In no case was a nationally or internationally significant number of birds recorded (for any taxon). For shorebird taxa, all records were restricted to the wetlands in the west of the Project Area (within the SWA02 IBRA subregion) and these areas are well outside of the proposed WTG locations footprint.

There have been seven BBUS of the PA to date (Umwelt, 2025h) and there have been no records of flight by any of the focal taxa of conservation significant wetland-dependent birds. That is, while some taxa have been recorded present in the wetland surveys reported here, none have been observed in flight in approximately 140 person-days of BBUS (which, notably, included constant surveillance for incidental records of conservation significant taxa and not solely systematic and dedicated BBUS methods). Flights by these taxa must have occurred but they have been a frequency so low as to not be detected by robust and targeted field methods conducted across a 27-month period.

Table 3.8 Summary of Focal Conservation Significant Wetland-dependent Bird Taxa

Scientific Name	Common Name	EPBC Listing	WA Listing	Likelihood of Occurrence	Total Count	Survey Days on which Recorded	Maximum Single Wetland Count	Maximum Same Day Count	Wetlands in which Recorded
<i>Oxyura australis</i>	Blue-billed Duck		P4	Known	12	11	23	23	WE-02, WE-C2
<i>Pluvialis fulva</i>	Pacific Golden Plover	MI	MI	High	-	-	-	-	-
<i>Rostratula australis</i>	Australian Painted Snipe	EN	EN	Low	-	-	-	-	-
<i>Limosa lapponica menzbieri</i>	Bar-tailed Godwit (northern Siberian)	EN & MI	CR & MI	Known	1	1	3	3	WE-C2
<i>Limosa limosa</i>	Black-tailed Godwit	EN & MI	MI	Known	1	1	1	1	WE-C2
<i>Calidris pugnax</i>	Ruff	MI	MI	Known	1	1	3	3	WE-C2
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	VU & MI	MI	Known	3	3	8	8	WE-C2
<i>Calidris ferruginea</i>	Curlew Sandpiper	CR & MI	CR	Known	1	1	1	1	WE-C2
<i>Calidris subminuta</i>	Long-toed Stint	MI	MI	Moderate	-	-	-	-	-
<i>Calidris ruficollis</i>	Red-necked Stint	MI	MI	Known	4	4	12	12	WE-C2
<i>Actitis hypoleucos</i>	Common Sandpiper	MI	MI	High	-	-	-	-	-
<i>Tringa glareola</i>	Wood Sandpiper	MI	MI	Known	2	2	15	15	WE-C1

Scientific Name	Common Name	EPBC Listing	WA Listing	Likelihood of Occurrence	Total Count	Survey Days on which Recorded	Maximum Single Wetland Count	Maximum Same Day Count	Wetlands in which Recorded
<i>Tringa nebularia</i>	Common Greenshank	EN & MI	MI	Known	4	3	6	6	WE-C1, WE-C2
<i>Plegadis falcinellus</i>	Glossy Ibis	MI	MI	High	-	-	-	-	-
<i>Pandion haliaetus</i>	Osprey	MI	MI	Low	-	-	-	-	-

East-Asian Australasian Flyway (EAAF) population estimates provided by van Swinderen et al. (2025), with the exception of Australian Painted Snipe where the latest estimate of APST (2026) was used.

International and national significance criteria calculated as per Driessen et al. (2025) as 1.0% and 0.1% of Flyway populations, respectively, and are provided in parentheses under the Site Significance column. This is based on the maximum same day counts for each taxon recorded within the PA.

† while the EAAF population of Ruff has been revised down in recent times, these birds are essentially a ‘spill over’ of the Central Asian Flyway population and are not considered to represent a unique conservation significant population. Global population estimates for this taxon are between 2.6 and 5.6 million individuals (BirdLife International, 2025). Given the almost-vagrant status of this species in the EAAF, no significance criteria were established here.

Table 3.9 **Commentary on Focal Taxa of Conservation Significant Wetland-dependent Birds**

Taxon	Occurrence	EAAF Population Estimate	Site Significance		Collision Risk
			Internationally	Nationally	
Blue-billed Duck	Up to 23 individuals (but usually less than 10) recorded on 12 survey dates (at all times of the year) from two wetlands. This is suggestive that there is a small resident population in the Project Area and with the maximum count occurring in later summer it is hypothesised that birds from the local area or region may contract to the larger, permanent wetlands at this time.	NA	NA	NA	Recorded at opposing sides (east and west) of the Survey Area and presumably flies between these sites (given the variable numbers at each locality), in which case birds may pass through or over the proposed wind farm. No flight records for the species were obtained during the survey program. Reid et al. (2023) suggests that approximately 50% of the species’ flight time occurs at altitudes between 30 m and 350 m AGL, with a further 10% of flight time spent above 350 m AGL. Therefore, it is possible the species may fly at RSA if passing through the proposed wind farm, albeit in low numbers.
Pacific Golden Plover	Not recorded but may occur as suitable habitat is available (almost certainly in very low numbers, if present). If present, highly likely to be restricted to wetlands in the west of the Project Area (given the apparent lack of suitability of wetlands in other areas).	150,000	No (1500)	No (150)	Not expected to be a measurable collision risk (presence not confirmed despite reasonable survey effort). If present, it is not expected to interact with WTG (with RSA movements restricted to the vicinity of wetlands at the western edge of the Survey Area, away from proposed WTG).

Taxon	Occurrence	EAAF Population Estimate	Site Significance		Collision Risk
			Internationally	Nationally	
Long-toed Stint	Not recorded but may occur as suitable habitat is available (almost certainly in very low numbers, if present). If present, highly likely to be restricted to wetlands in the west of the Project Area (given the apparent lack of suitability of wetlands in other areas).	230,000	No (2300)	No (230)	
Common Sandpiper	Not recorded but may occur as some suitable habitat is available (likely to be in very low numbers, if present). If present, likely to be mostly restricted to wetlands in the west of the Project Area (most other wetlands appear to lack of suitability for this taxon).	190,000	No (1900)	No (190)	
Osprey	Not recorded and but may occur as some suitable habitat is available (likely to be in very low numbers, if present, and probably on a vagrant-basis). If present, likely to be restricted to deeper wetlands in the west of the Project Area.	NA	NA	NA	
Australian Painted Snipe	Not recorded and very unlikely to occur given known distribution of the taxon and density of regional records.	340	No	No	Not expected to be a measurable collision risk (presence within the Project Area highly unlikely).
Bar-tailed Godwit	Three individuals recorded on one wetland once during the survey period. This taxon appears to be a very occasional visitor to the western edge of the Project Area in very low numbers.	375,000	No (3750)	No (375)	Only recorded from the western edge of the Survey Area and, as such, there is no evidence to suggest that birds currently make local traverses (i.e. those that are more likely to be at RSA height) through the proposed wind farm area.
Black-tailed Godwit	One individual recorded on one wetland once during the survey period. This taxon appears to be a very occasional visitor to	230,000	No (2300)	No (230)	Collision with WTG is not expected. Risk associated with transmission lines in the vicinity of the western wetlands is considered negligible

Taxon	Occurrence	EAAF Population Estimate	Site Significance		Collision Risk
			Internationally	Nationally	
	the western edge of the Project Area in very low numbers.				to low (based on abundance, spatial and temporal occurrence patterns to date, body size and expected flight behaviours). No flight observations for these species were obtained during the survey program. Flight height information relevant to shorebirds is poorly understood, though it is known that they undertake long-distance flights at high altitudes between non-breeding and breeding ranges and may fly at RSA between foraging or roosting sites in their non-breeding range. However, these species are expected to be primarily restricted to the western portion of the PA outside of the turbine footprint.
Ruff	Three individuals recorded on one wetland once during the survey period. This taxon appears to be a very occasional visitor to the western edge of the Project Area in very low numbers.	750 †	NA	NA	
Sharp-tailed Sandpiper	Up to eight individuals recorded on three occasions from a single wetland. This taxon appears to be an occasional visitor to the western edge of the Project Area in low numbers.	130,000	No (1300)	No (130)	
Curlew Sandpiper	One individual recorded on one wetland once during the survey period. This taxon appears to be a very occasional visitor to the western edge of the Project Area in very low numbers.	120,000	No (1200)	No (120)	
Red-necked Stint	Up to 12 individuals recorded on four occasions from a single wetland. This taxon appears to be an occasional visitor to the western edge of the Project Area in low numbers.	600,000	No	600,000	
Wood Sandpiper	Up to fifteen individuals recorded on two occasions from a single wetland. This taxon appears to be an occasional visitor to the western edge of the Project Area in low numbers.	130,000	No (1300)	No (130)	
Common Greenshank	Up to six individuals recorded on four occasions from a single wetland. This taxon appears to be an occasional visitor	110,000	No (1100)	No (110)	

Taxon	Occurrence	EAAF Population Estimate	Site Significance		Collision Risk
			Internationally	Nationally	
	to the western edge of the Project Area in low numbers.				
Glossy Ibis	Not recorded but may occur as some suitable habitat is available. If present, likely to be mostly restricted to wetlands in the west of the Project Area (most other wetlands appear to lack of suitability for this taxon).	NA	NA	NA	Although not recorded to date, if present this taxon is not expected to interact appreciably with WTG (as for Pacific Golden Plover) but transmission lines in the west may be a low-level to inconsequential risk (Galtbalt et al., 2025).

3.2.5 Summary

- A total of 47 wetland-dependent bird taxa were recorded across 96 surveys at 11 wetlands (in the 18 months between October 2024 and May 2026), including nine taxa of conservation significance (eight EPBC/BC Act shorebirds and one Priority waterfowl).
- The majority of species recorded were common residents or taxa that may make local or regional seasonal movements (but not long-distance ‘true’ migrants) and reflect taxa that are generally widespread and abundant in south-western Western Australia.
- No conservation significant taxa were among those that were most commonly recorded, were most abundant overall, or had the highest local population.
- There was large variation in number of wetland-dependent bird taxa recorded at each wetland and this likely reflects the large variation observed in the physical wetland parameters, with higher diversity associated with larger, more complex wetlands (e.g. WE-02, WE-C2, WE-C1) and lower diversity associated with small, ephemeral or disturbed wetlands (e.g. WE-06, WE-08, WE-C4).
- Notably, wetland-dependent birds were not distributed evenly across the Survey Area, with much greater concentration (and diversity) on wetlands to the west of the Survey Area (in the SWA02 IBRA subregion). The exception to this trend was Lake Yangy (WE-02), in the east.
- A strong temporal trend was observed; with higher wetland-dependent bird abundances in summer and many fewer birds recorded in the winter and spring periods. This reflects the typical trend exhibited by wetland-dependent birds in south-western Western Australia of dispersal to ephemeral wetlands for breeding and/or foraging in winter or spring and contraction to permanent or near-permanent wetlands (e.g. WE-C2, WE-02 within the Survey Area) in later summer.
- All taxa of conservation significant migratory shorebirds recorded were observed in very low numbers and sporadically, with no evident trends in temporal use of the Survey Area wetlands. None had nationally or internationally significant numbers within the Project Area.
- All taxa of conservation significant migratory shorebirds recorded were only recorded from wetlands in the west of the Survey Area (in the SWA02 IBRA subregion). These sites are located at least 3.5 km from the nearest proposed WTG.
- There have been no observations of flight of conservation significant wetland-dependent bird taxa in 140 person-days of BBUS across a 27-month period. Incidence of flight is, therefore, below detectable levels for this method.
- There is no evidence to suggest that shorebirds fly through the proposed wind farm development footprint.
- Given the very low numbers, erratic nature of occurrence and unlikely passage through the WTG field, the collision risk (and, therefore, potential impact) to shorebird taxa from the Project is considered to be inconsequential.
- The Blue-billed Duck was recorded regularly, in low numbers, at opposing sides (east and west) of the Survey Area and presumably flies between these sites.
- Blue-billed Duck may transit through or over the proposed wind farm, including through the RSA. There may be some negligible-to-minor risk of strike for this taxon.
- Impacts from aspects other than WTG collision are discussed below.

4.0 Synthesis

The Yathroo Wind Farm Project Area and surrounds include wetlands, both permanent and ephemeral, that support wetland-dependent birds. A total of 47 wetland-dependent bird taxa have been recorded from surveys within the Survey Area and these include some taxa that are conservation significant (i.e. listed under federal or state acts, or ranked as priority taxa by DBCA).

The wetlands of the Survey Area also have potential to support other taxa that have not yet been recorded but a risk assessment undertaken here has shown that only about 5 to 6% of all mapped 'geomorphic' wetlands (*sensu* Semeniuk & Semeniuk, 1995) in the RCA are likely (or known) to support conservation significant taxa. These higher-potential wetlands are almost all located in the west of the RCA and are very strongly associated with the SWA02 (Perth) IBRA subregion, as opposed to the SWA01 (Dandaragan Plateau) subregion in the central and east RCA.

For the purposes of this assessment, there are 15 conservation significant wetland-dependent 'taxa of interest' that have either been highlighted by desktop review or database searches, recorded as part of this survey program or identified by DCCEEW as taxa to consider. Two of these taxa (Australian Painted Snipe and Osprey) are considered unlikely to occur within the Project Area and detailed assessments have focussed on the remaining 12 shorebird taxa and one waterfowl. Nine of these taxa have been confirmed within the RCA and/or PA as part of environmental studies for the Project.

Field investigations supported the desktop assessment of wetlands by demonstrating that recorded conservation significant wetland-dependent taxa of interest were highly localised to wetlands of the western Survey Area (hence also the PA and RCA). This pattern was also true of those taxa not currently noted as conservation significant. The exception to this characterisation is WE-02 (Lake Yangy) located in the east of the PA which has regularly supported a diverse and abundant water-dependent bird assemblage. It should be noted however that the only conservation significant taxa recorded at this location was the Blue-billed Duck.

Additionally, numbers and occurrence of migratory shorebirds across the field survey program to date have been low with only a few individuals of each species recorded on any one occasion. While the Blue-billed Duck has been observed more regularly and in slightly higher numbers, its occurrence still remains relatively low compared to other wetland-dependent birds recorded. Similar geomorphic wetland types are also generally well represented within the RCA providing suitable habitat for ongoing utilisation by wetland-dependent bird taxa.

Any on-site utilisation by the taxa of interest is expected to be concentrated around the wetlands located within the SW02 IBRA subregion (to the west), including transit between these wetlands as well as the coast (for migratory shorebirds undertaking longer distance movements). The Project has been planned to avoid these areas wherever possible. Design modifications have been made such that WTG infrastructure placement exceeds a 3.5 km buffer of wetlands where EPBC Act listed species have been recorded to date. Project infrastructure in closer proximity to these wetlands will be limited to transmission infrastructure, the BESS compound, and ancillary infrastructure.

In their review for the International Union for Conservation of Nature (IUCN), Bennun et al. (2021) identified and categorised the possible impacts to bird species from onshore wind farm developments as: turbine and transmission line collisions, habitat loss, electrocution from distribution lines, barrier effects, trophic cascades, pollution, indirect impacts such as land use change, ecosystem service impacts, and introduction of alien species. The likelihood of these

impacts on the conservation significant wetland-dependent taxa of interest here is discussed in Table 4.1.

Table 4.1 Potential Impacts to Wetland-dependent Birds

Potential Impact	Likelihood
Collisions with turbines blades and/or transmission lines	Low Collisions with turbines are unlikely based on the spatial distribution of taxa within the western portion of the PA (away from WTG infrastructure) and the very low abundances of the taxa of interest recorded on site. While there are no data available for the RCA to describe the movement corridors or pathways (should they even exist) either specifically (for any given taxon) or generally (for functionally similar groups of taxa), the survey data collected as part of the field investigations here do not provide any evidence to suggest that the <i>shorebird</i> taxa of interest make passage (irrespective of flight height) ‘across’ (in an west-east direction) the proposed development footprint. Based on available habitat in the region, and the ecology of the taxa in question, <i>shorebirds</i> appear to be much more likely to move north-south along the wetland chains of the SWA02 IBRA subregion, or west to the coast, and not in a west-east orientation between wetlands of SWA02 (west) and SWA01 (east). As above, there are no data available (specifically or generally) to describe or define the flight behaviour of <i>shorebirds</i> in the RCA. Despite the considerable survey effort devoted to targeted wetland-dependent bird surveys (this report) and the seven BBUS surveys conducted for the Project to date, there are no flight-height records for these taxa. Given the very low abundances, and erratic and infrequent occurrence, of <i>shorebirds</i> in the PA, this is unsurprising. Broadly speaking (drawing from sources such as Dokter et al., 2011; Senner et al., 2018; Galtbalt et al., 2025; Watts et al., 2021 and Lilleyman et al., 2021), shorebirds are expected to fly very high when they traverse long distances for true ‘migration’ flights (above RSA height; at altitudes in the hundreds of metres to kilometres). They are likely to make passage at lower heights for local movements, such as those between local wetlands (at altitudes of tens to low-hundreds of metres, including below, within and, possibly, above RSA height). Migration flights for <i>shorebirds</i> are more likely to occur at night, with local movements often dictated by tidal patterns (not relevant to the Project in this case) and, therefore, may occur at any time of the day. For the Project, while the local movement of <i>shorebirds</i> within the PA could potentially put these taxa in conflict with WTG, the evidence to date (abundance and spatiotemporal patterns) suggests that collision risk is low (at worst) to negligible (more likely). Any possible collision risk associated with shorebirds is more likely to be related to transmission line infrastructure which can be mitigated through line markers and other controls. Blue-billed Duck (as discrete from <i>shorebirds</i>) may undertake low-scale local movements at RSA height within the proposed development footprint.
Habitat loss through clearance or displacement	Low No wetlands where conservation significant bird taxa have been recorded are being permanently modified or removed as part of construction. All wetlands

Potential Impact	Likelihood
	utilised by conservation significant taxa are also not expected to become otherwise impacted or isolated by the presence of nearby infrastructure.
Mortality through electrocution on distribution lines	Low Electrocution by distribution lines is a threat posed to birds perching on (or contacting) lines and coincidentally touching a grounded object or another line. All conservation significant taxa assessed here are not expected to utilise any wires or lines for perching, and the wingspans of these taxa make any contact-electrocution highly improbable.
Barrier effects	Low As for habitat loss. All wetlands utilised by conservation significant taxa are also not expected to become otherwise impacted or isolated by the presence of nearby infrastructure. All taxa are highly mobile and aerial and, thus, can navigate through the landscape in three-dimensional space. No infrastructure associated with the project will pose any risk to impeding passage of these taxa.
Trophic cascades	Low Trophic cascades primarily impact species occupying higher trophic levels such as raptors. The only conservation significant raptor species (Osprey) assessed here is considered unlikely to occur. No impacts to wetland parameters (including water levels, pH and other chemical properties, including nutrient levels) are expected and, thus, no flow-on trophic impacts to wetland-dependent bird taxa are anticipated.
Pollution (dust, light, noise and vibration, solid/liquid waste)	Low Pollution may only present a material risk in wetland areas during construction phases and can be directly managed through appropriate measures included in management plans such as lighting controls and management of stormwater discharge.
Indirect impacts	Low Indirect impacts include changes to land use which create new impact pathways. Given the PA is predominantly cleared agriculture land already heavily impacted by cattle grazing and other agricultural activities it is unlikely the land use change will exacerbate existing indirect impacts. Risks such as blade glint, shadow flicker and blade throw are unlikely to present a material risk to conservation significant taxa. Blade glint and blade throw are not identified as risks to migratory shorebirds in published literature and shadow flicker is restricted to areas containing WTG infrastructure which are located away from the key wetland habitats in the western portion of the PA.
Associated ecosystem service impacts	Low Not considered an impact pathway to biodiversity or conservation significant taxa.
Introduction of invasive alien species	Low Appropriate management and hygiene measures can be implemented during construction and operations to maintain biosecurity within the PA.

4.1 Summary

In summary, only very low numbers of only a few conservation significant shorebird taxa have been irregularly and inconsistently recorded at only a small percentage of wetlands within the PA (and these are largely confined to a localised, western, portion of the PA associated with the SWA02 IBRA bioregion). Project design and the proposed placement of WTG infrastructure have actively avoided areas known to be used by, or best suited to, conservation significant shorebird taxa. Equivalent and adjacent habitat occurs within the broader RCA and this will also assist to minimise or buffer conservation risks to listed (or priority) taxa. In addition, the mitigation of reasonably expected on-site impacts during the construction and operation of BESS and transmission infrastructure (to be located in area where shorebirds are most likely to occur) will further reduce any residual risk. Monitoring and management programs, such as environmental management plans and a bird and bat adaptive management plan, will be implemented to address these residual risks.

There are no expected impacts ('significant' or otherwise) to any shorebird taxa at the species-, flyway- (EAAF), national-, or regional-population levels. Furthermore, no *significant* impacts to shorebird taxa at the local- (PA) population level are expected with, at most, only minor temporary disturbances to a few individuals considered possible.

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Appendix A

Wetland Dependant Species



Appendix Table A.1 List of Western Australian Taxa of Wetland Dependant Birds

Family	Scientific Name	Common Name	Wetland Dependency Sub-category
Anseranatidae	<i>Anseranas semipalmata</i>	Magpie Goose	Waterfowl
Anatidae	<i>Dendrocygna eytoni</i>	Plumed Whistling Duck	Waterfowl
Anatidae	<i>Dendrocygna arcuata</i>	Wandering Whistling Duck	Waterfowl
Anatidae	<i>Cereopsis novaehollandiae grisea</i>	Recherche Cape Barren Goose	Waterfowl
Anatidae	<i>Cygnus atratus</i>	Black Swan	Waterfowl
Anatidae	<i>Cygnus olor</i>	Mute Swan	Waterfowl
Anatidae	<i>Stictonetta naevosa</i>	Freckled Duck	Waterfowl
Anatidae	<i>Radjah radjah</i>	Radjah Shelduck	Waterfowl
Anatidae	<i>Tadorna tadornoides</i>	Australian Shelduck	Waterfowl
Anatidae	<i>Malacorhynchus membranaceus</i>	Pink-eared Duck	Waterfowl
Anatidae	<i>Chenonetta jubata</i>	Maned Duck	Waterfowl
Anatidae	<i>Nettapus pulchellus</i>	Green Pygmy Goose	Waterfowl
Anatidae	<i>Spatula querquedula</i>	Garganey	Waterfowl
Anatidae	<i>Spatula rhynchotis</i>	Australasian Shoveler	Waterfowl
Anatidae	<i>Spatula clypeata</i>	Northern Shoveler	Waterfowl
Anatidae	<i>Mareca penelope</i>	Eurasian Wigeon	Waterfowl
Anatidae	<i>Anas superciliosa</i>	Pacific Black Duck	Waterfowl
Anatidae	<i>Anas platyrhynchos</i>	Mallard	Waterfowl
Anatidae	<i>Anas acuta</i>	Northern Pintail	Waterfowl
Anatidae	<i>Anas crecca</i>	Green-winged Teal	Waterfowl
Anatidae	<i>Anas gracilis</i>	Grey Teal	Waterfowl
Anatidae	<i>Anas castanea</i>	Chestnut Teal	Waterfowl
Anatidae	<i>Aythya australis</i>	Hardhead	Waterfowl
Anatidae	<i>Oxyura australis</i>	Blue-billed Duck	Waterfowl
Anatidae	<i>Biziura lobata</i>	Musk Duck	Waterfowl
Rallidae	<i>Crex crex</i>	Corn Crake	Aquatic Waterbirds
Rallidae	<i>Gallirallus castaneoventris</i>	Chestnut Rail	Aquatic Waterbirds
Rallidae	<i>Gallirallus philippensis</i>	Buff-banded Rail	Aquatic Waterbirds
Rallidae	<i>Tribonyx ventralis</i>	Black-tailed Nativehen	Aquatic Waterbirds
Rallidae	<i>Gallinula tenebrosa</i>	Dusky Moorhen	Aquatic Waterbirds
Rallidae	<i>Porzana fluminea</i>	Australian Crake	Aquatic Waterbirds
Rallidae	<i>Fulica atra</i>	Eurasian Coot	Aquatic Waterbirds
Rallidae	<i>Porphyrio porphyrio</i>	Purple Swamphen	Aquatic Waterbirds
Rallidae	<i>Zapornia pusilla</i>	Baillon's Crake	Aquatic Waterbirds

Family	Scientific Name	Common Name	Wetland Dependency Sub-category
Rallidae	<i>Zapornia tabuensis</i>	Spotless Crake	Aquatic Waterbirds
Rallidae	<i>Rallina fasciata</i>	Red-legged Crake	Aquatic Waterbirds
Rallidae	<i>Poliolimnas cinereus</i>	White-browed Crake	Aquatic Waterbirds
Rallidae	<i>Gallicrex cinerea</i>	Watercock	Aquatic Waterbirds
Rallidae	<i>Amaurornis phoenicurus</i>	White-breasted Waterhen	Aquatic Waterbirds
Rallidae	<i>Amaurornis moluccana</i>	Pale-vented Bush-hen	Aquatic Waterbirds
Gruidae	<i>Antigone antigone</i>	Sarus Crane	Wading Waterbirds
Gruidae	<i>Antigone rubicunda</i>	Brolga	Wading Waterbirds
Podicipedidae	<i>Tachybaptus ruficollis</i>	Little Grebe	Aquatic Waterbirds
Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	Aquatic Waterbirds
Podicipedidae	<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe	Aquatic Waterbirds
Podicipedidae	(blank)	Unidentified small grebe	Aquatic Waterbirds
Podicipedidae	<i>Podiceps cristatus</i>	Great Crested Grebe	Aquatic Waterbirds
Burhinidae	<i>Esacus magnirostris</i>	Beach Stone-curlew	Shorebirds
Haematopodidae	<i>Haematopus longirostris</i>	Pied Oystercatcher	Shorebirds
Haematopodidae	<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	Shorebirds
Recurvirostridae	<i>Himantopus himantopus</i>	Black-winged Stilt	Shorebirds
Recurvirostridae	<i>Himantopus leucocephalus</i>	Pied Stilt	Shorebirds
Recurvirostridae	<i>Cladorhynchus leucocephalus</i>	Banded Stilt	Shorebirds
Recurvirostridae	<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet	Shorebirds
Charadriidae	<i>Vanellus tricolor</i>	Banded Lapwing	Shorebirds
Charadriidae	<i>Vanellus miles</i>	Masked Lapwing	Shorebirds
Charadriidae	<i>Erythronyx cinctus</i>	Red-kneed Dotterel	Shorebirds
Charadriidae	<i>Peltohyas australis</i>	Inland Dotterel	Shorebirds
Charadriidae	<i>Pluvialis fulva</i>	Pacific Golden Plover	Shorebirds
Charadriidae	<i>Pluvialis dominica</i>	American Golden Plover	Shorebirds
Charadriidae	<i>Pluvialis squatarola</i>	Grey Plover	Shorebirds
Charadriidae	<i>Charadrius hiaticula</i>	Common Ringed Plover	Shorebirds
Charadriidae	<i>Charadrius semipalmatus</i>	Semipalmated Plover	Shorebirds
Charadriidae	<i>Thinornis dubius</i>	Little Ringed Plover	Shorebirds
Charadriidae	<i>Anarhynchus alexandrinus</i>	Kentish Plover	Shorebirds
Charadriidae	<i>Anarhynchus ruficapillus</i>	Red-capped Plover	Shorebirds
Charadriidae	<i>Anarhynchus bicinctus</i>	Double-banded Plover	Shorebirds

Family	Scientific Name	Common Name	Wetland Dependency Sub-category
Charadriidae	<i>Anarhynchus mongolus</i>	Siberian Sand Plover	Shorebirds
Charadriidae	<i>Anarhynchus leschenaultii</i>	Greater Sand Plover	Shorebirds
Charadriidae	<i>Anarhynchus veredus</i>	Oriental Plover	Shorebirds
Charadriidae	<i>Thinornis cucullatus</i>	Hooded Plover	Shorebirds
Charadriidae	<i>Thinornis melanops</i>	Black-fronted Dotterel	Shorebirds
Rostratulidae	<i>Rostratula australis</i>	Australian Painted-snipe	Shorebirds
Jacaniidae	<i>Irediparra gallinacea</i>	Comb-crested Jacana	Shorebirds
Jacaniidae	<i>Hydrophasianus chirurgus</i>	Pheasant-tailed Jacana	Shorebirds
Scolopacidae	<i>Numenius phaeopus</i>	Eurasian Whimbrel	Shorebirds
Scolopacidae	<i>Numenius minutus</i>	Little Curlew	Shorebirds
Scolopacidae	<i>Numenius madagascariensis</i>	Far Eastern Curlew	Shorebirds
Scolopacidae	<i>Numenius arquata</i>	Eurasian Curlew	Shorebirds
Scolopacidae	<i>Limosa lapponica lapponica</i>	European Bar-tailed Godwit	Shorebirds
Scolopacidae	<i>Limosa lapponica menzbieri</i>	Bar-tailed Godwit (northern Siberian)	Shorebirds
Scolopacidae	<i>Limosa lapponica baueri</i>	Bar-tailed Godwit (western Alaskan)	Shorebirds
Scolopacidae	<i>Limosa limosa</i>	Black-tailed Godwit	Shorebirds
Scolopacidae	<i>Limosa haemastica</i>	Hudsonian Godwit	Shorebirds
Scolopacidae	<i>Arenaria interpres</i>	Ruddy Turnstone	Shorebirds
Scolopacidae	<i>Calidris tenuirostris</i>	Great Knot	Shorebirds
Scolopacidae	<i>Calidris canutus</i>	Red Knot	Shorebirds
Scolopacidae	<i>Calidris pugnax</i>	Ruff	Shorebirds
Scolopacidae	<i>Calidris falcinellus</i>	Broad-billed Sandpiper	Shorebirds
Scolopacidae	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Shorebirds
Scolopacidae	<i>Calidris ferruginea</i>	Curlew Sandpiper	Shorebirds
Scolopacidae	<i>Calidris temminckii</i>	Temminck's Stint	Shorebirds
Scolopacidae	<i>Calidris subminuta</i>	Long-toed Stint	Shorebirds
Scolopacidae	<i>Calidris ruficollis</i>	Red-necked Stint	Shorebirds
Scolopacidae	<i>Calidris alba</i>	Sanderling	Shorebirds
Scolopacidae	<i>Calidris alpina</i>	Dunlin	Shorebirds
Scolopacidae	<i>Calidris bairdii</i>	Baird's Sandpiper	Shorebirds
Scolopacidae	<i>Calidris minuta</i>	Little Stint	Shorebirds
Scolopacidae	<i>Calidris fuscicollis</i>	White-rumped Sandpiper	Shorebirds
Scolopacidae	<i>Calidris subruficollis</i>	Buff-breasted Sandpiper	Shorebirds
Scolopacidae	<i>Calidris melanotos</i>	Pectoral Sandpiper	Shorebirds

Family	Scientific Name	Common Name	Wetland Dependency Sub-category
Scolopacidae	<i>Limnodromus semipalmatus</i>	Asian Dowitcher	Shorebirds
Scolopacidae	<i>Gallinago hardwickii</i>	Latham's Snipe	Shorebirds
Scolopacidae	<i>Gallinago stenura</i>	Pin-tailed Snipe	Shorebirds
Scolopacidae	<i>Gallinago megala</i>	Swinhoe's Snipe	Shorebirds
Scolopacidae	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Shorebirds
Scolopacidae	<i>Phalaropus fulicarius</i>	Red Phalarope	Shorebirds
Scolopacidae	<i>Xenus cinereus</i>	Terek Sandpiper	Shorebirds
Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpiper	Shorebirds
Scolopacidae	<i>Tringa brevipes</i>	Grey-tailed Tattler	Shorebirds
Scolopacidae	<i>Tringa totanus</i>	Common Redshank	Shorebirds
Scolopacidae	<i>Tringa stagnatilis</i>	Marsh Sandpiper	Shorebirds
Scolopacidae	<i>Tringa glareola</i>	Wood Sandpiper	Shorebirds
Scolopacidae	<i>Tringa erythropus</i>	Spotted Redshank	Shorebirds
Scolopacidae	<i>Tringa nebularia</i>	Common Greenshank	Shorebirds
Scolopacidae	<i>Tringa guttifer</i>	Nordmann's Greenshank	Shorebirds
Glareolidae	<i>Glareola isabella</i>	Australian Pratincole	Shorebirds
Glareolidae	<i>Glareola pratincola</i>	Collared Pratincole	Shorebirds
Glareolidae	<i>Glareola maldivarum</i>	Oriental Pratincole	Shorebirds
Laridae	<i>Anous stolidus</i>	Brown Noddy	Seabirds
Laridae	<i>Anous tenuirostris melanops</i>	Australian Lesser Noddy	Seabirds
Laridae	<i>Anous minutus</i>	Black Noddy	Seabirds
Laridae	<i>Gygis candida</i>	Blue-billed White Tern	Seabirds
Laridae	<i>Xema sabini</i>	Sabine's Gull	Seabirds
Laridae	<i>Chroicocephalus novaehollandiae</i>	Silver Gull	Wetland Associated
Laridae	<i>Chroicocephalus ridibundus</i>	Black-headed Gull	Seabirds
Laridae	<i>Leucophaeus atricilla</i>	Laughing Gull	Seabirds
Laridae	<i>Leucophaeus pipixcan</i>	Franklin's Gull	Seabirds
Laridae	<i>Larus pacificus</i>	Pacific Gull	Seabirds
Laridae	<i>Larus crassirostris</i>	Black-tailed Gull	Seabirds
Laridae	<i>Larus dominicanus</i>	Kelp Gull	Seabirds
Laridae	<i>Larus fuscus</i>	Lesser Black-backed Gull	Seabirds
Laridae	<i>Gelochelidon nilotica</i>	Gull-billed Tern	Wetland Associated
Laridae	<i>Gelochelidon macrotarsa</i>	Australian Tern	Seabirds
Laridae	<i>Hydroprogne caspia</i>	Caspian Tern	Wetland Associated
Laridae	<i>Thalasseus bergii</i>	Greater Crested Tern	Seabirds

Family	Scientific Name	Common Name	Wetland Dependency Sub-category
Laridae	<i>Thalasseus bengalensis</i>	Lesser Crested Tern	Seabirds
Laridae	<i>Sternula albifrons</i>	Little Tern	Seabirds
Laridae	<i>Sternula nereis nereis</i>	Fairy Tern	Seabirds
Laridae	<i>Onychoprion anaethetus</i>	Bridled Tern	Seabirds
Laridae	<i>Onychoprion fuscatus</i>	Sooty Tern	Seabirds
Laridae	<i>Sterna dougallii</i>	Roseate Tern	Seabirds
Laridae	<i>Sterna striata</i>	White-fronted Tern	Seabirds
Laridae	<i>Sterna sumatrana</i>	Black-naped Tern	Seabirds
Laridae	<i>Sterna hirundo</i>	Common Tern	Seabirds
Laridae	<i>Sterna paradisaea</i>	Arctic Tern	Seabirds
Laridae	<i>Sterna vittata</i>	Antarctic Tern	Seabirds
Laridae	<i>Chlidonias hybrida</i>	Whiskered Tern	Wetland Associated
Laridae	<i>Chlidonias leucopterus</i>	White-winged Tern	Wetland Associated
Stercorariidae	<i>Stercorarius maccormicki</i>	South Polar Skua	Seabirds
Stercorariidae	<i>Stercorarius antarcticus lonnbergi</i>	Brown Skua	Seabirds
Stercorariidae	<i>Stercorarius pomarinus</i>	Pomarine Jaeger	Seabirds
Stercorariidae	<i>Stercorarius parasiticus</i>	Parasitic Jaeger	Seabirds
Stercorariidae	<i>Stercorarius longicaudus</i>	Long-tailed Jaeger	Seabirds
Phaethontidae	<i>Phaethon aethereus</i>	Red-billed Tropicbird	Seabirds
Phaethontidae	<i>Phaethon rubricauda</i>	Red-tailed Tropicbird	Seabirds
Phaethontidae	<i>Phaethon lepturus</i>	White-tailed Tropicbird	Seabirds
Spheniscidae	<i>Aptenodytes patagonicus</i>	King Penguin	Seabirds
Spheniscidae	<i>Eudyptes pachyrhynchus</i>	Fiordland Penguin	Seabirds
Spheniscidae	<i>Eudyptes robustus</i>	Snares Penguin	Seabirds
Spheniscidae	<i>Eudyptes sclateri</i>	Erect-crested Penguin	Seabirds
Spheniscidae	<i>Eudyptes chrysocome</i>	Western Rockhopper Penguin	Seabirds
Spheniscidae	<i>Eudyptes filholi</i>	Eastern Rockhopper Penguin	Seabirds
Spheniscidae	<i>Eudyptes moseleyi</i>	Northern Rockhopper Penguin	Seabirds
Spheniscidae	<i>Eudyptes schlegeli</i>	Royal Penguin	Seabirds
Spheniscidae	<i>Eudyptes chrysolophus</i>	Macaroni Penguin	Seabirds
Spheniscidae	<i>Eudyptula minor</i>	Little Penguin	Seabirds
Oceanitidae	<i>Oceanites oceanicus</i>	Wilson's Storm Petrel	Seabirds
Oceanitidae	<i>Garrodia nereis</i>	Grey-backed Storm Petrel	Seabirds
Oceanitidae	<i>Pelagodroma marina</i>	White-faced Storm Petrel	Seabirds

Family	Scientific Name	Common Name	Wetland Dependency Sub-category
Oceanitidae	<i>Fregetta tropica</i>	Black-bellied Storm Petrel	Seabirds
Diomedidae	<i>Diomedea exulans</i>	Snowy Albatross	Seabirds
Diomedidae	<i>Diomedea antipodensis antipodensis</i>	Antipodean Albatross	Seabirds
Diomedidae	<i>Diomedea antipodensis gibsoni</i>	Gibson's Albatross	Seabirds
Diomedidae	<i>Diomedea amsterdamensis</i>	Amsterdam Albatross	Seabirds
Diomedidae	<i>Diomedea dabbenena</i>	Tristan Albatross	Seabirds
Diomedidae	<i>Diomedea epomophora</i>	Southern Royal Albatross	Seabirds
Diomedidae	<i>Diomedea sanfordi</i>	Northern Royal Albatross	Seabirds
Diomedidae	<i>Phoebastria fusca</i>	Sooty Albatross	Seabirds
Diomedidae	<i>Phoebastria palpebrata</i>	Light-mantled Albatross	Seabirds
Diomedidae	<i>Thalassarche melanophrys melanophrys</i>	Black-browed Albatross	Seabirds
Diomedidae	<i>Thalassarche melanophrys impavida</i>	Campbell Albatross	Seabirds
Diomedidae	<i>Thalassarche cauta</i>	Shy Albatross	Seabirds
Diomedidae	<i>Thalassarche salvini</i>	Salvin's Albatross	Seabirds
Diomedidae	<i>Thalassarche chrysostoma</i>	Grey-headed Albatross	Seabirds
Diomedidae	<i>Thalassarche chlororhynchos</i>	Atlantic Yellow-nosed Albatross	Seabirds
Diomedidae	<i>Thalassarche carteri</i>	Indian Yellow-nosed Albatross	Seabirds
Diomedidae	<i>Thalassarche bulleri</i>	Buller's Albatross	Seabirds
Hydrobatidae	<i>Hydrobates monorhis</i>	Swinhoe's Storm Petrel	Seabirds
Hydrobatidae	<i>Hydrobates leucorhous</i>	Leach's Storm Petrel	Seabirds
Hydrobatidae	<i>Hydrobates matsudairae</i>	Matsudaira's Storm Petrel	Seabirds
Procellariidae	<i>Macronectes giganteus</i>	Southern Giant Petrel	Seabirds
Procellariidae	<i>Macronectes halli</i>	Northern Giant Petrel	Seabirds
Procellariidae	<i>Fulmarus glacialis</i>	Southern Fulmar	Seabirds
Procellariidae	<i>Thalassoica antarctica</i>	Antarctic Petrel	Seabirds
Procellariidae	<i>Daption capense</i>	Pintado Petrel	Seabirds
Procellariidae	<i>Halobaena caerulea</i>	Blue Petrel	Seabirds
Procellariidae	<i>Pachyptila vittata</i>	Broad-billed Prion	Seabirds
Procellariidae	<i>Pachyptila salvini</i>	Salvin's Prion	Seabirds
Procellariidae	<i>Pachyptila macgillivrayi</i>	MacGillivray's Prion	Seabirds
Procellariidae	<i>Pachyptila desolata</i>	Antarctic Prion	Seabirds

Family	Scientific Name	Common Name	Wetland Dependency Sub-category
Procellariidae	<i>Pachyptila belcheri</i>	Slender-billed Prion	Seabirds
Procellariidae	<i>Pachyptila turtur</i>	Fairy Prion	Seabirds
Procellariidae	<i>Aphrodroma brevirostris</i>	Kerguelen Petrel	Seabirds
Procellariidae	<i>Pterodroma macroptera</i>	Great-winged Petrel	Seabirds
Procellariidae	<i>Pterodroma gouldi</i>	Grey-faced Petrel	Seabirds
Procellariidae	<i>Pterodroma lessonii</i>	White-headed Petrel	Seabirds
Procellariidae	<i>Pterodroma mollis</i>	Soft-plumaged Petrel	Seabirds
Procellariidae	<i>Pterodroma neglecta</i>	Kermadec Petrel	Seabirds
Procellariidae	<i>Pterodroma heraldica</i>	Herald Petrel	Seabirds
Procellariidae	<i>Pterodroma arminjoniana</i>	Trindade Petrel	Seabirds
Procellariidae	<i>Pterodroma barau</i>	Barau's Petrel	Seabirds
Procellariidae	<i>Pterodroma cervicalis</i>	White-necked Petrel	Seabirds
Procellariidae	<i>Pterodroma leucoptera</i>	Gould's Petrel	Seabirds
Procellariidae	<i>Pterodroma cookii</i>	Cook's Petrel	Seabirds
Procellariidae	<i>Pterodroma pycrofti</i>	Pycroft's Petrel	Seabirds
Procellariidae	<i>Pseudobulweria aterrima</i>	Mascarene Petrel	Seabirds
Procellariidae	<i>Pseudobulweria rostrata</i>	Tahiti Petrel	Seabirds
Procellariidae	<i>Procellaria cinerea</i>	Grey Petrel	Seabirds
Procellariidae	<i>Procellaria aequinoctialis</i>	White-chinned Petrel	Seabirds
Procellariidae	<i>Procellaria westlandica</i>	Westland Petrel	Seabirds
Procellariidae	<i>Calonectris leucomelas</i>	Streaked Shearwater	Seabirds
Procellariidae	<i>Calonectris borealis</i>	Cory's Shearwater	Seabirds
Procellariidae	<i>Ardenna pacifica</i>	Wedge-tailed Shearwater	Seabirds
Procellariidae	<i>Ardenna grisea</i>	Sooty Shearwater	Seabirds
Procellariidae	<i>Ardenna tenuirostris</i>	Short-tailed Shearwater	Seabirds
Procellariidae	<i>Ardenna carneipes</i>	Flesh-footed Shearwater	Seabirds
Procellariidae	<i>Ardenna gravis</i>	Great Shearwater	Seabirds
Procellariidae	<i>Puffinus puffinus</i>	Manx Shearwater	Seabirds
Procellariidae	<i>Puffinus gavia</i>	Fluttering Shearwater	Seabirds
Procellariidae	<i>Puffinus huttoni</i>	Hutton's Shearwater	Seabirds
Procellariidae	<i>Puffinus persicus</i>	Persian Shearwater	Seabirds
Procellariidae	<i>Puffinus heinrothi</i>	Heinroth's Shearwater	Seabirds
Procellariidae	<i>Puffinus assimilis</i>	Little Shearwater	Seabirds
Procellariidae	<i>Pelecanoides urinatrix</i>	Common Diving Petrel	Seabirds
Procellariidae	<i>Bulweria bulwerii</i>	Bulwer's Petrel	Seabirds
Procellariidae	<i>Bulweria fallax</i>	Jouanin's Petrel	Seabirds
Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	Wading Waterbirds

Family	Scientific Name	Common Name	Wetland Dependency Sub-category
Fregatidae	<i>Fregata andrewsi</i>	Christmas Frigatebird	Seabirds
Fregatidae	<i>Fregata minor</i>	Great Frigatebird	Seabirds
Fregatidae	<i>Fregata ariel</i>	Lesser Frigatebird	Seabirds
Sulidae	<i>Morus capensis</i>	Cape Gannet	Seabirds
Sulidae	<i>Morus serrator</i>	Australasian Gannet	Seabirds
Sulidae	<i>Papasula abbotti</i>	Abbott's Booby	Seabirds
Sulidae	<i>Sula dactylatra</i>	Masked Booby	Seabirds
Sulidae	<i>Sula sula</i>	Red-footed Booby	Seabirds
Sulidae	<i>Sula leucogaster</i>	Brown Booby	Seabirds
Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian Darter	Aquatic Waterbirds
Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	Little Pied Cormorant	Aquatic Waterbirds
Phalacrocoracidae	<i>Phalacrocorax fuscescens</i>	Black-faced Cormorant	Seabirds
Phalacrocoracidae	<i>Phalacrocorax varius</i>	Australian Pied Cormorant	Aquatic Waterbirds
Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	Aquatic Waterbirds
Phalacrocoracidae	<i>Phalacrocorax carbo</i>	Great Cormorant	Aquatic Waterbirds
Phalacrocoracidae	<i>Leucocarbo atriceps</i>	Imperial Shag	Seabirds
Threskiornithidae	<i>Threskiornis molucca</i>	Australian White Ibis	Wading Waterbirds
Threskiornithidae	<i>Threskiornis spinicollis</i>	Straw-necked Ibis	Wading Waterbirds
Threskiornithidae	<i>Plegadis falcinellus</i>	Glossy Ibis	Wading Waterbirds
Threskiornithidae	<i>Platalea regia</i>	Royal Spoonbill	Wading Waterbirds
Threskiornithidae	<i>Platalea flavipes</i>	Yellow-billed Spoonbill	Wading Waterbirds
Ardeidae	<i>Botaurus poiciloptilus</i>	Australasian Bittern	Wading Waterbirds
Ardeidae	<i>Botaurus minutus</i>	Little Bittern	Wading Waterbirds
Ardeidae	<i>Botaurus dubius</i>	Black-backed Bittern	Wading Waterbirds
Ardeidae	<i>Botaurus sinensis</i>	Yellow Bittern	Wading Waterbirds
Ardeidae	<i>Botaurus eurhythmus</i>	Von Schrenck's Bittern	Wading Waterbirds
Ardeidae	<i>Botaurus flavicollis</i>	Black Bittern	Wading Waterbirds
Ardeidae	<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	Wading Waterbirds
Ardeidae	<i>Nycticorax caledonicus</i>	Nankeen Night Heron	Wading Waterbirds
Ardeidae	<i>Butorides atricapilla</i>	Little Heron	Wading Waterbirds
Ardeidae	<i>Ardeola speciosa</i>	Javan Pond Heron	Wading Waterbirds
Ardeidae	<i>Ardea coromanda</i>	Eastern Cattle Egret	Wading Waterbirds
Ardeidae	<i>Ardea cinerea</i>	Grey Heron	Wading Waterbirds
Ardeidae	<i>Ardea pacifica</i>	White-necked Heron	Wading Waterbirds
Ardeidae	<i>Ardea sumatrana</i>	Great-billed Heron	Wading Waterbirds
Ardeidae	<i>Ardea purpurea</i>	Purple Heron	Wading Waterbirds

Family	Scientific Name	Common Name	Wetland Dependency Sub-category
Ardeidae	<i>Ardea alba</i>	Great Egret	Wading Waterbirds
Ardeidae	<i>Ardea intermedia</i>	Medium Egret	Wading Waterbirds
Ardeidae	<i>Ardea plumifera</i>	Plumed Egret	Wading Waterbirds
Ardeidae	<i>Egretta picata</i>	Pied Heron	Wading Waterbirds
Ardeidae	<i>Egretta novaehollandiae</i>	White-faced Heron	Wading Waterbirds
Ardeidae	<i>Egretta garzetta</i>	Little Egret	Wading Waterbirds
Ardeidae	<i>Egretta sacra</i>	Pacific Reef Heron	Wading Waterbirds
Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian Pelican	Aquatic Waterbirds
Pandionidae	<i>Pandion haliaetus</i>	Osprey	Wetland Associated
Accipitridae	<i>Circus approximans</i>	Swamp Harrier	Wetland Associated
Accipitridae	<i>Haliastur sphenurus</i>	Whistling Kite	Wetland Associated
Accipitridae	<i>Haliastur indus</i>	Brahminy Kite	Wetland Associated
Accipitridae	<i>Ichthyophaga leucogaster</i>	White-bellied Sea Eagle	Wetland Associated
Alcedinidae	<i>Todiramphus chloris</i>	Collared Kingfisher	Mangrove Associated
Alcedinidae	<i>Ceyx azureus</i>	Azure Kingfisher	Wetland Associated
Acanthizidae	<i>Gerygone levigaster</i>	Mangrove Gerygone	Mangrove Associated
Acanthizidae	<i>Gerygone tenebrosa</i>	Dusky Gerygone	Mangrove Associated
Acanthizidae	<i>Gerygone magnirostris</i>	Large-billed Gerygone	Mangrove Associated
Pachycephalidae	<i>Pachycephala melanura</i>	Mangrove Golden Whistler	Mangrove Associated
Rhipiduridae	<i>Rhipidura phasiana</i>	Mangrove Fantail	Mangrove Associated
Monarchidae	<i>Myiagra ruficollis</i>	Broad-billed Flycatcher	Mangrove Associated
Monarchidae	<i>Myiagra alecto</i>	Shining Flycatcher	Wetland Associated
Monarchidae	<i>Myiagra nana</i>	Paperbark Flycatcher	Wetland Associated
Petroicidae	<i>Melanodryas pulverulenta</i>	Mangrove Robin	Mangrove Associated
Acrocephalidae	<i>Acrocephalus orientalis</i>	Oriental Reed Warbler	Wetland Associated
Acrocephalidae	<i>Acrocephalus australis</i>	Australian Reed Warbler	Wetland Associated
Locustellidae	<i>Poodytes gramineus</i>	Little Grassbird	Wetland Associated
Cisticolidae	<i>Cisticola juncidis</i>	Zitting Cisticola	Wetland Associated
Cisticolidae	<i>Cisticola exilis</i>	Golden-headed Cisticola	Wetland Associated
Estrildidae	<i>Emblema ruficauda</i>	Star Finch	Wetland Associated
Motacillidae	<i>Motacilla tschutschensis</i>	Eastern Yellow Wagtail	Wetland Associated
Motacillidae	<i>Motacilla cinerea</i>	Grey Wagtail	Wetland Associated
Motacillidae	<i>Motacilla alba</i>	White Wagtail	Wetland Associated

Appendix B

Representative Wetland Photographs



Appendix Table B.1

Representative Photographs of Surveyed Wetlands

WE-01



WE-02



WE-04



WE-05

Not available

WE-06



WE-07



WE-08

Not available

WE-C1



WE-C2



WE-C3



WE-C4

Not available

Appendix C

Conservation Significant Taxa Records

Appendix Table C.1 Conservation Significant Wetland-dependent Taxa Records

Survey	Date	Wetland	Survey Start Time	Scientific Name	Common Names
BT01	29/10/2024	WE-C1	-	<i>Tringa glareola</i>	Wood Sandpiper
BT01	1/11/2024	WE-C1	-	<i>Tringa glareola</i>	Wood Sandpiper
BBUS02	15/02/2025	WE-02	13:10	<i>Oxyura australis</i>	Blue-billed Duck
BBUS02	15/02/2025	WE-C2	9:45	<i>Limosa limosa</i>	Black-tailed Godwit
BBUS02	15/02/2025	WE-C2	9:45	<i>Calidris pugnax</i>	Ruff
BBUS02	15/02/2025	WE-C2	9:45	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper
BBUS02	15/02/2025	WE-C2	9:45	<i>Calidris ruficollis</i>	Red-necked Stint
BBUS02	15/02/2025	WE-C2	9:45	<i>Tringa nebularia</i>	Common Greenshank
BBUS03	7/05/2025	WE-02	12:21	<i>Oxyura australis</i>	Blue-billed Duck
TS01	23/09/2025	WE-02	11:43	<i>Oxyura australis</i>	Blue-billed Duck
BBUS05	14/10/2025	WE-C2	8:32	<i>Oxyura australis</i>	Blue-billed Duck
BBUS05	17/10/2025	WE-02	8:30	<i>Oxyura australis</i>	Blue-billed Duck
TS02	2/12/2025	WE-02	12:30	<i>Oxyura australis</i>	Blue-billed Duck
TS02	2/12/2025	WE-C2	09:05	<i>Oxyura australis</i>	Blue-billed Duck
TS03	17/12/2025	WE-02	13:33	<i>Oxyura australis</i>	Blue-billed Duck
TS03	17/12/2025	WE-C2	9:30	<i>Limosa lapponica menzbieri</i>	Bar-tailed Godwit (northern Siberian)
TS04	28/01/2026	WE-02	14:01	<i>Oxyura australis</i>	Blue-billed Duck
TS04	28/01/2026	WE-C1	8:17	<i>Tringa nebularia</i>	Common Greenshank
TS04	28/01/2026	WE-C2	9:38	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper
TS04	28/01/2026	WE-C2	9:38	<i>Calidris ruficollis</i>	Red-necked Stint
TS04	28/01/2026	WE-C2	9:38	<i>Tringa nebularia</i>	Common Greenshank
BBUS06	16/02/2026	WE-C1	12:45	<i>Tringa nebularia</i>	Common Greenshank
BBUS06	17/02/2026	WE-C2	7:45	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper
BBUS06	17/02/2026	WE-C2	7:45	<i>Calidris ferruginea</i>	Curlew Sandpiper
BBUS06	17/02/2026	WE-C2	7:45	<i>Calidris ruficollis</i>	Red-necked Stint
BBUS06	19/02/2026	WE-02	9:45	<i>Oxyura australis</i>	Blue-billed Duck
BBUS06	20/02/2026	WE-02	9:15	<i>Oxyura australis</i>	Blue-billed Duck
TS05	12/03/2026	WE-02	14:40	<i>Oxyura australis</i>	Blue-billed Duck
TS05	12/03/2026	WE-C2	9:28	<i>Calidris ruficollis</i>	Red-necked Stint
BBUS07	19/05/2026	WE-02	13:59	<i>Oxyura australis</i>	Blue-billed Duck



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