Appendix I

Significant Impact Assessment

1.0 Banksia Woodlands of the Swan Coastal Plain

Table I.1 TEC Description: Banksia Woodlands of the Swan Coastal Plain Ecological Community

Banksia Woodlands of the Swan Coastal Plain Ecological Community	
Profile	**Conservation Status:** Cth: Endangered **Description**: The ecological community is a woodland associated with the Swan Coastal Plain of southwest Western Australia. A key diagnostic feature is a prominent tree layer of Banksia, with scattered eucalypts and other tree species often present among or emerging above the Banksia canopy. The understorey is a species rich mix of sclerophyllous shrubs, graminoids and forbs. The ecological community is characterised by a high endemism and considerable localised variation in species composition across its range (Department of the Environment, 2016). **Distribution**: The 'Banksia Woodland of the Swan Coastal Plain' TEC is largely confined to the Perth and Dandaragan Plateau IBRA subregions of the Swan Coastal Plan (SCP) IBRA region. It is mainly located on the deep Bassendean and Spearwood sands, and occasionally Quindalup sands (typically on the eastern edge), on shallow sands overlying more complex stratigraphic sequences on the foothills of the Ridge Hill Shelf, Whicher Scarp and Gingin/Dandaragan Scarp. This TEC occurs within an area of strong seasonal variation in climate and a fire-prone environment and therefore supports species with a range of life history traits that allow them to persist in fire-prone environments (DoEE, 2016a). **Previous records**: Desktop database searches identified that the TEC is likely to occur in Desktop Study Area **Area Critical to the Survival of the Ecological Community**: The areas considered critical to the survival of the Banksia Woodlands covers all patches that meet the key diagnostic characteristics and condition thresholds for the ecological community, plus the buffer zones, particularly where this comprises surrounding native

Banksia Woodlands of the Swan Coastal Plain Ecological Community	
	vegetation. This is because this ecological community occurs in a landscape that has often been very heavily cleared and modified and now exists as mostly very small and highly fragmented patches (Department of the Environment, 2016). **Threats**: Key threats as listed in the Conservation Advice (Department of the Environment, 2016). are: • Clearing and fragmentation. • Dieback diseases (especially those caused by *Phytophthora* species) • Invasive species • Fire regime change (particularly increased fire frequency) • Hydrological degradation (groundwater abstraction, eutrophication, soil acidification). • Climate change • Grazing • Decline in pollinating and seed dispersing fauna. • Loss of keystone Banksia species and fragmenting of nectar/pollen nutritional networks.
In the Project Area	**Ecological Community Occurrence** <u>F&V Survey Area</u> Three patches of Banksia Woodlands of the Swan Coastal Plain TEC were recorded inside the F&V Survey Area that met both the patch size and vegetation condition criteria of Good or better. Ten patches did not meet the patch size criteria and/or the vegetation condition criteria for their mapped extents in the F&V Survey Area, but they represent vegetation that is contiguous with the occurrence of the TEC immediately outside the F&V Survey Area, which in some cases are unsurveyed blocks of native vegetation within the Project Area. These 13 patches of the TEC comprise a total area of 41.3 ha within the F&V Survey Area and are illustrated in **Figure 6.5**. No patches (either wholly or partially) of the TEC were in 'Pristine', 'Excellent', or 'Very Good' condition. <u>Indicative Project Footprint</u> 0.11 ha of Degraded TEC is located within the Indicative Project Footprint. Clearing of this TEC is required to gain access to the Project Area west of Brand Highway. Redesign work has meant that the 'Good' and 'Very Good' condition TEC immediately to the south can be avoided.

Table I.2 Banksia Woodlands of the Swan Coastal Plain Ecological Community Significant Impact Assessment

Criteria	Assessment of the Project
Reduce the extent of an ecological community	Clearing of 0.11 ha of Degraded TEC is required to gain access to the Project Area west of Brand Highway where the BESS is proposed to be constructed and connected to existing Western Power transmission infrastructure. Redesign work has meant that the 'Good' and 'Very Good' condition TEC immediately to the South can be avoided. Although direct clearing of the TEC reduces its extent, the clearing has been restricted to 0.11 ha of Degraded TEC. Based on this, the reduction in the extent of the TEC is not deemed to be significant.
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	The Degraded TEC proposed to be cleared is already considered fragmented as an existing access track currently bisects it. The proposed TEC clearing is required to gain access to the western part of the Project Area so the BESS can be constructed and connected to existing transmission infrastructure. This is unlikely to increase the fragmentation of the TEC.
Adversely affect habitat critical to the survival of an ecological community.	The areas considered critical to the survival of the TEC covers all patches that meet the key diagnostic characteristics and condition thresholds for the TEC. Areas of vegetation in Good condition that meet the diagnostic criteria for the TEC have been avoided and remain outside the Indicative Project Footprint.
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.	Given the minimal extent and distributed nature of proposed vegetation clearing, impacts to soil quality (such as soil salinity) are unlikely to occur within the Project Area. Groundwater is proposed to be abstracted from a confined aquifer in excess of 100m deep and impacts to the TEC as a result of this drawdown are unlikely. The current proposed groundwater abstraction bore is located approximately 10 km from the nearest mapped TEC within the F&V Survey Area. The Project is not likely to result in land use alterations that would modify water quality or availability, or nutrient balances necessary to the survival of the TEC in the Project Area. Surface water drainage patterns may be slightly modified in areas required for earthworks as part of Project construction, but this is unlikely to impact any areas mapped as critical to the survival of this TEC.
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example	No prescribed burning regimes, altered bushfire patterns, or flora or fauna harvesting is proposed as part of the Project. Additionally, given the minor clearing of Degraded TEC and the avoidance of all areas mapped in Good condition, the Project is unlikely to cause a substantial change to its species composition or occurrence within the Project Area.

Criteria	Assessment of the Project
through regular burning or flora or fauna harvesting.	
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: • assisting invasive species, that are harmful to the listed ecological community, to become established, or • causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.	Given that direct impacts to the TEC are limited to the clearing of 0.11 ha of Degraded TEC, and noting all TEC in Good condition or better has been avoided, the Project is unlikely to cause a substantial reduction in the quality or integrity of the TEC. Management of invasive species, chemicals or other potential pollutants will be achieved through implementation of the CEMP (**Appendix G**).
Interfere with the recovery of an ecological community	A Recovery Plan is not in place for this TEC as the Conservation Advice sufficiently outlines the priority research and conservation actions needed for the TEC (Department of the Environment, 2016). These actions are listed as protect, restore, and communicate and support. <u>Protect</u> The Project has sought to protect the TEC by avoiding all Good condition TEC and limiting clearing to 0.11 ha of Degraded TEC. Indirect impacts such as weeds, feral animals and dieback will be managed through implementation of the CEMP. <u>Restore</u> An environmental offset is anticipated to be required under the Part V EP Act Native Vegetation Clearing Permit process and will be developed in accordance with the WA Environmental Offset Policy 2011 and Environment Offset Guidelines 2014.

Criteria	Assessment of the Project
	Communication and Support All workers on site will be required to partake in an environmental induction which will identify the locations and importance of TEC's within the Project Area. Information will also be included on weed and pest management, native vegetation clearing management and dust management.

2.0 Carnaby's Black-Cockatoo

Table I.1 Species Description: Carnaby's Black-Cockatoo

Carnaby's Black-Cockatoo (*Zanda latirostris*)	
Profile	**Conservation Status:** Cth: Endangered, WA: Endangered. **Habitat:** The Carnaby's Black-Cockatoo occurs in uncleared or remnant native eucalypt woodlands and remnant patches of native vegetation on land otherwise cleared for agriculture where it forages on eucalypt species and proteaceous shrubs. The species also forages seasonally in pine plantations which provide a supplementary food source in areas where native vegetation has undergone extensive clearing. Suitable roosting habitat for the species includes tall trees in proximity to water sources such as flooded gum forests along drainage lines. Suitable breeding habitat can comprise any eucalypt species (dead or alive) supporting suitable hollows but is most often Wandoo, Salmon Gum, and Marri although breeding has been recorded in a range of other species. **Distribution:** Carnaby's Black-Cockatoo is endemic to, and widespread in, the south-west of Western Australia. Breeding mainly occurs in the wheatbelt, from the Stirling Ranges north-west to near Three Springs, but has also been recorded on the coastal plain to the south-west, around Bunbury (Higgins, 1999; D. A. Saunders, 1974). **Previous Records:** Over 310 records of this species have been recorded within the Desktop Study Area. None of these records were from within the Project Area. **Local and Regional Context:** As described in **Section 6.3.2**, within 12 km of the Project Area: • There is approximately 40,010 ha of government mapped remnant native vegetation that potentially provides foraging habitat for Carnaby's Black-Cockatoo. Of this area, approximately 12,592 ha is within conservation estate.

Carnaby's Black-Cockatoo (*Zanda latirostris*)

- Black-Cockatoo confirmed breeding areas mapped by DBCA are located approximately 6 km northeast of the Project Area in Cataby and 6 km southeast of the Project Area.
- There is approximately 5,698 ha of remnant vegetation which is likely to contain vegetation that can support Black-Cockatoo breeding trees. Of these areas, approximately 348 ha is within conservation estate.
- There is one confirmed roost site, approximately 7 km south of the Project Area near Regans Ford.
- There is approximately 5,205 ha of remnant vegetation which is likely to contain vegetation that can support Black-Cockatoo roosting trees. Of these areas, approximately 348 ha is within conservation estate.

Habitat Critical to the Survival of the Species:

Habitat critical to survival of Carnaby's Black-Cockatoo has been summarised in the Recovery Plan (DPAW, 2013) as:

- Eucalypt woodlands that provide nest hollows used for breeding, together with nearby vegetation that provides feeding, roosting and watering habitat that supports successful breeding
- Woodland sites known to have supported breeding in the past and which could be used in the future, provided adequate nearby food and/or water resources are available or are re-established
- In the non-breeding season the vegetation that provides food resources as well as the sites for nearby watering and night roosting that enable the cockatoos to effectively utilise the available food resources.

Important Populations:

Carnaby's Black-Cockatoo is considered to occur as one large, interconnected population, despite some east–west genetic structuring (DPAW, 2013). The species undertakes seasonal movements between breeding areas in the wheatbelt and non-breeding foraging and roosting areas on the Swan Coastal Plain and forested regions of the south-west.

Under the MNES *Significant Impact Guidelines 1.1* (Department of the Environment, 2013b), an important population is one that is:

- a key source population for breeding or dispersal;
- necessary for maintaining genetic diversity; or
- near the limit of the species' range.

Threats:

Key threatening processes for Carnaby's Black-Cockatoo as identified in the species Recovery Plan (DPAW, 2013) include habitat loss, habitat degradation, mining and extraction activities, illegal shooting, illegal taking, climate change, collision with motor vehicles and

Carnaby's Black-Cockatoo (*Zanda latirostris*)	
	disease. Other recognised potential threats identified in the species SPRAT include competition for nest hollows, illegal trade, conflict with humans, fire events leading to loss of productive foraging habitat, and low rate of productivity.
In the Project Area	**Species Occurrence:** The Carnaby's Black-Cockatoo has been observed approximately 80 times in the Project Area across the field survey program, with a maximum flock size of 200 recorded. **Habitat** A description of foraging, breeding and roosting habitat values for Carnaby's Black-Cockatoo in the Indicative Project Footprint, Development Corridor, and Project Area is provided in **Section 6.3.2**. A summary is provided below. Foraging A broad-scale foraging habitat assessment of the Project Area identified approximately 467.5 ha of habitat with Moderate to high or High foraging value (site condition), including Marri Jarah Forest, Banksia Woodland, Low Shrubland habitat types. Other habitat types were assessed at a broad-scale as having Negligible, Low, Low to moderate, or Moderate foraging value. Targeted Black-Cockatoo foraging habitat assessment was undertaken across 99.9% of the Development Corridor utilising the (Bamford, 2020) site condition scoring methodology with the resultant mapping presented in **Appendix C**. Almost 93% of the Development Corridor was assessed as having Low, Negligible or No foraging value for Black-Cockatoos. Areas of Moderate or better foraging value were isolated and mostly occurred in the south-east of the Development Corridor. There were also narrow areas of higher-quality foraging along Walyer Walyer Road in the central-south area of the Development Corridor. The foraging scores of vegetation (native, isolated remnant trees and planted) present within the Indicative Project Footprint for Carnaby's Black-Cockatoo is presented in **Table 7.2**. A summary of foraging scores in the Development Corridor, Indicative Project Footprint, and areas avoided is provided in **Table 9.1**. Breeding A full census survey of potential Black-Cockatoo nest-trees (Rank 1 – 5) was conducted across 697.9 ha (95.7%) of the Indicative Project Footprint utilising the (Bamford, 2020) methodology. A 'partial' survey (all Rank 1 – 3 trees, but only opportunistically surveyed for Rank 4 and 5 trees) was undertaken across 26 ha (3.6) of the Indicative Project Footprint, with the remaining 5.1 ha (0.7%) not assessed. The unassessed areas are primarily cleared land devoid of trees. A complete assessment of Rank 1 – 5 trees was completed over 2,596.6 ha (75.4%) of the Development Corridor, with 762.3 ha (22.1%) subject to a 'partial' survey. Eight-four (84) ha (2.5%) of the Development Corridor has not been assessed

Carnaby's Black-Cockatoo (*Zanda latirostris*)

In total 560 potential Black-Cockatoo nest trees were assessed in the Development Corridor and 112 in the Indicative Project Footprint, with the results presented in **Table 6.10**. A series of maps showing the locations of all trees assessed is provided in **Appendix C**.

No active nest-trees (Rank 1) were recorded in the Development Corridor.

Roosting

A number of roost watches were undertaken as part of the field survey program.

On the evenings of 1 and 2 November 2024, Carnaby's Black-Cockatoo roosting was observed in a section of Flooded Gum Forest habitat with a flowing watercourse (refer Roost A, Figure 6.9). Up to eight individuals were recorded at once, and it was assessed that it is likely roosting also occurs opportunistically in other similar habitat throughout the Project Area.

On the nights of 6 and 7 May 2025, up to 110 Carnaby's Black-Cockatoo were observed coming into roost at the western edge of the Project Area adjacent to the wetlands (Roost B, Figure 6.9).

On the night of 23 June 2025, a flock of approximately 150 to 200 Carnaby's Black-Cockatoo were tracked with observations noted in **Table 6.13** and illustrated in **Figure 6.10**.

All roost areas are outside the Development Corridor.

Table I.2 Carnaby's Black-Cockatoo Significant Impact Assessment

Criteria	Assessment of the Project
Lead to a long-term decrease in the size of an important population.	The Project is unlikely to lead to a long-term decrease in the size of an important population based on: • avoiding all high-quality foraging habitat • avoiding 466.85 ha (99.86%) of the highest quality foraging habitat in the Project Area • avoiding all Rank 1 and Rank 2 potential Black-Cockatoo nest-trees • avoiding known Roost sites within the Project Area • adopting a minimum blade tip height of 59 m AGL that is above typical flight height range observed for the species. <u>Impact on habitat</u> The Project has sought to minimise the clearing of native vegetation as far as practicable, resulting in clearing limits of 10.28 ha of remnant native vegetation, 5.45 ha of isolated remnant trees in cleared agricultural land and 7.33 ha of planted vegetation (native and non-native). The foraging values of this vegetation to Carnaby's Black-Cockatoo has been scored (Bamford, 2020) as follows: • 1.42 ha is of no foraging value • 6.30 ha is negligible to low foraging value • 4.32 ha is low foraging value • 6.63 ha is low to moderate foraging value • 2.68 ha is moderate foraging value • 0.65 ha is moderate to high foraging value, • None is high value foraging value • 1.05 ha has not been assessed but is likely low to moderate. Proposed clearing of remnant vegetation and planted trees in the Indicative Project Footprint represents approximately 0.05% of potentially suitable foraging habitat within 12km of the Project Area (see **Section 6.3.2**). A potential Black-Cockatoo nest assessment recorded 560 potential nest-trees (DBH > 500 mm) within the Development Corridor, 112 of which lie in the Indicative Project Footprint. No active nests (Rank 1) were recorded within the Development Corridor, and although six Rank 2 and 19 Rank 3 trees were recorded in the Development Corridor, the Project has been designed to avoid clearing all Rank 2 trees and minimise clearing of Rank 3 trees. Two roosting sites have been identified during the field survey program both of which lie outside the Development Corridor. <u>Impact on individuals</u>

Criteria	Assessment of the Project
	The main risk posed to Carnaby's Black-Cockatoo individuals as a result of the Project is turbine blade strike. To understand the level of this risk, BBUS surveys sought to identify site utilisation and flight characteristics of Carnaby's Black-Cockatoos within the Project Area. Forty-two (42) Carnaby's Black-Cockatoo flight height records were captured within the Project Area (**Table 7.5**). The species was not recorded flying within the RSA, and the maximum flight height of 50 m AGL was recorded on three occasions, consisting of one to two individuals. As illustrated in the ERM (**Figure 7.1a**), the majority (99%) of Carnaby's flight time within the Project Area occurred below 30 m AGL. Furthermore, BCE (Bamford, 2025) observed through the collection of 3,772 Carnaby's flight height records, that all but one flight height record was in the range of 0 – 50 m AGL. The exception was a single flight height of two individuals that that briefly rose to an estimated 60 m AGL before descending (Bamford, 2025).
Reduce the area of occupancy of the species.	The area of occupancy for Carnaby's Black-Cockatoo *(Zanda latirostris)* is estimated to range between approximately 54,500 km^2 and 86,800 km^2 (D. Saunders et al., 2021). The Project Area occurs well within the species' current distribution and does not coincide with the range limits. Database reviews undertaken for the assessment confirmed that no mapped roosting or breeding sites for Carnaby's Black-Cockatoo occur within the Project Area. The proposed clearing associated with the Project is limited to a small fraction of the total native vegetation within the surrounding landscape and primarily affects fragmented edge habitat rather than intact woodland. Similar and higher-quality habitat is extensively available within adjacent reserves such as Namming Nature Reserve and Moore River National Park. The proportion of potential Carnaby's foraging habitat proposed to be cleared represents less than 0.05% of the native vegetation available within 12 km of the Project Area (see Section **6.3.2**). Given the species' highly mobile nature, extensive regional habitat availability, and the absence of localised roosts or breeding colonies within the Development Corridor, the clearing of fragmented foraging habitat is not likely to materially reduce the area of occupancy for Carnaby's Black-Cockatoo.
Fragment an existing population into two or more populations.	The Carnaby's Black-Cockatoo (*Zanda latirostris*) is a highly mobile, wide-ranging species that undertakes seasonal movements across the Wheatbelt in response to the availability of food resources, water, and suitable hollow-bearing trees (DCCEEW, 2024b; Rycken, 2019). The Project will avoid the clearing of high-quality foraging value habitat and the species is considered to typically fly below RSA given current knowledge of Black-Cockatoo flight behaviours (see **Section 7.2.1.1**). In circumstances where birds are passing across less-expansive cleared areas between patches of remnant trees or isolated individual trees (as is present throughout

Criteria	Assessment of the Project
	much of the Project Area) they usually maintain a 'canopy height' flight path (Umwelt, 2025c) which is below the minimum RSA height for the Project (59 m AGL). Turbines and associated infrastructure in the Project Area are unlikely to interrupt regional movement of the species such that a population is fragmented. Available information on Black-Cockatoo behaviour indicates that Carnaby's Black-Cockatoo typically move between scattered tree patches at or below canopy height when crossing partially cleared agricultural landscapes (DCCEEW, 2024b; Umwelt, 2025c). The distribution of native vegetation in the areas surrounding the Development Corridor will continue to provide movement and foraging opportunities if flocks were to move through the landscape between known roosting or breeding sites. The maximum loss of 10.28 ha of remnant native vegetation, 5.45 ha of isolated remnant trees and 7.33 ha of planted vegetation (native and non-native) will be distributed across the Indicative Project Footprint and is not likely to substantially increase fragmentation effects. Therefore, it is considered unlikely that the Project would result in the fragmentation of populations of Carnaby's Black-Cockatoo as a result of either collision risk, habitat loss, or altered movement patterns across the broader landscape.
Adversely affect habitat critical to the survival of a species.	The Project will result in the clearing of 10.28 ha of remnant native vegetation, 5.45 ha of isolated remnant trees and 7.33 ha of planted vegetation (native and non-native). Of this proposed clearing, no habitat is of high foraging value, 0.65 ha has a foraging value of moderate to high, and the remaining habitat has a foraging value of moderate or below. A Black-Cockatoo potential nest-tree assessment has been completed for the majority (>99%) of the Indicative Project Footprint. The Project will avoid all Rank 1 and Rank 2 potential Black-Cockatoo nest-trees and the clearing of Rank 3 trees will be minimised. Habitat within the Project Area is not considered unique, and the removal of fragmented Carnaby's Black-Cockatoo habitat (that is mainly of low to moderate value or less) is considered to be minor relative to 40,100 ha of similar or better quality native vegetation within 12 km of the Project Area.
Disrupt the breeding cycle of a population.	A Black-Cockatoo potential nest-tree assessment has been completed for the majority (>99%) of the Indicative Project Footprint. The Project will avoid all Rank 1 and Rank 2 potential Black-Cockatoo nest-trees and the clearing of Rank 3 trees will be minimised. Furthermore, no activities will be undertaken within 50 m of any hollow found to be actively in use by the species. Foraging habitat within the Project Area is already heavily fragmented, and proposed clearing is mainly confined to individual trees or edges of patches of degraded vegetation, the majority of which is of low to moderate foraging value or lower. Black-Cockatoo turbine strike is expected to be unlikely due to the adoption of a minimum blade tip height of 59 mAGL which is above the flight heights observed from Project BBUS completed to date, and from flight heights recorded in similar environments by BCE (Bamford, 2020).

Criteria	Assessment of the Project
	Implementation of the Project BBAMP as required by the granted Development Application will manage the residual risk of Black-Cockatoo turbine strike. In consideration of the above, it is unlikely the Project would disrupt the breeding cycle of a population of Carnaby's Black-Cockatoo.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Carnaby's Black-Cockatoo habitat within the Project Area is heavily fragmented and proposed clearing is primarily restricted to individual trees or patches of vegetation at the perimeter of larger remnant patches which themselves are of degraded condition. Habitats within the broader region are likely to be more intact and of higher quality than habitats within the Project Area. The Project will result in the clearing of 0.65 ha of habitat with moderate to high value foraging habitat (Site condition 5), with remaining clearing being moderate or lower foraging habitat (Site condition 4 and below). The Project will avoid all Rank 1 and Rank 2 potential Black-Cockatoo nest-trees and the clearing of Rank 3 trees will be minimised. The proposed clearing represents approximately 0.05% of similar or better-quality habitat within 12 km of the Project Area. This is a very low proportion of impact to habitat that is not unique in the area, is fragmented, and is relatively lower quality than the intact surrounding remnant native vegetation. Based on the above, it is considered unlikely that the permanent removal of vegetation or the operation of wind turbines will alter habitat to the extent where the species is likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	Introduced corellas (*Cacatua species*), galahs (*Cacatua roseicapilla*), Australian shelducks (*Tadorna tadornoides*), Australian wood ducks (*Chenonetta jubata*) and feral European honey bees (*Apis mellifera*) are recognised as natural competitors for nesting hollows used by Black-Cockatoo species (Johnstone et al., 2011; Johnstone, R.E. & Kirkby, T., 2008). Corellas, galahs, Australia shelducks and Australian Wood Duck have all been recorded in the Project Area as part of the field survey program, however Project activities are not expected to result in an increase to their local populations. No feral European honeybee activity or hives were recorded during the fauna surveys. Other invasive species identified within the broader Project Area include the Red Fox (Vulpes vulpes) and Laughing Kookaburra (*Dacelo novaeguineae*), but neither of these pose a direct ecological threat to Carnaby's Black-Cockatoo in terms of nesting or foraging competition. During construction, the highest potential for introduction or spread of invasive species will occur through the movement of vehicles, equipment, and materials. To mitigate this risk, strict vehicle and machinery hygiene protocols will be implemented as part of the Project's CEMP. This includes requirements for clean-down procedures prior to site entry, weed and pest

Criteria	Assessment of the Project
	inspections, and restrictions on importing fill or vegetation material from unverified sources. Construction personnel will also undergo environmental inductions that highlight biosecurity responsibilities and species protection measures. Considering the above, the Project is considered unlikely to result in invasive species becoming established within the Project Area that pose a threat to the Carnaby's Black-Cockatoo.
Introduce disease that may cause the species to decline.	Infectious diseases such as beak and feather disease virus (BFDV), avian polyomavirus (APV) and chlamydophilosis may pose a threat to Carnaby's Black-Cockatoo (DEWHA, 2005). The potential for these diseases to be spread as a result of Project activities is considered to be highly unlikely as the disease is primarily spread through transmission from infected birds or nesting material which may be exacerbated by the high concentrations of individuals congregating in areas and feeding by the public without proper sanitation of feeding areas. Phytophthora dieback, Marri canker disease and Marri shoot blight can pose a threat to Black-Cockatoo foraging and breeding species within the Project Area. No Forest Disease Risk Area for Phytophthora dieback mapped by DBCA are located near to the Project Area. Marri canker disease and Marri shoot blight are caused by fungal pathogens. Both diseases have been causing a decline in Marri over a number of years and due to their impact on both reproductive and vegetative tissues, affect the capacity for these trees to provide foraging and breeding habitat for Black-Cockatoo species. While Marri canker disease is suspected to be endemic to southwest WA, Marri shoot blight is an introduced disease and no control or management options have been developed for WA (Marbus et al., 2011; Paap et al., 2012). The Project will implement standard biosecurity management practices to minimise the risk of introduction or spread of these diseases. Biosecurity management measures to manage the diseases identified above will include: • Ensuring all ground disturbing plant and equipment enter site clean and free of weeds or dieback • Ensuring any fill brought to site will be accompanied with a clean fill certificate. Where practicable, the fill should be from a quarry (i.e. not reused from another site) that has a Dieback Management Plan in place. • Therefore, the Project is considered unlikely to result in the introduction of diseases that may cause the species to decline.
Interfere with the recovery of the species.	The recovery of Carnaby's Black-Cockatoo is guided by the species' recovery plan (DPAW, 2013), which identifies the following ongoing threats to the species' persistence and recovery: • Loss and degradation of breeding, foraging, and roosting habitat; • Decline in tree health and loss of hollow-bearing eucalypts; • Mining and extraction activities; • Illegal shooting or taking of individuals;

Criteria	Assessment of the Project
	• Impacts of climate change on food and habitat resources; • Collisions with vehicles or infrastructure; and • The spread of disease, including Phytophthora dieback, Marri canker, and beak and feather disease virus (BFDV) (DCCEEW, 2025f; DPAW, 2013). As described against previous criteria, the Project has materially avoided impacts to high quality foraging habitat, Rank 1 and 2 potential nest-trees, and confirmed roosting locations. Proposed clearing is primarily restricted to individual trees or patches of vegetation at the perimeter of larger remnant patches which themselves are of degraded condition. The Project does not involve any mining or extraction activities, nor is it expected to increase the occurrence of illegal shooting and taking of individuals. The Project will directly contribute to the mitigation of climate change impacts in the long-term by supporting WA's green energy transition through an increase in renewable energy sources. While there will be an increase in traffic within and around the Project Area during construction, speed limits will be sign-posted throughout the Project Area to minimise the potential for vehicle collision. The risk of turbine collision is likely to be low as surveys to date and literature from other works (Bamford, 2020) shows the species typically flies below the RSA (59m AGL). Standard biosecurity measures will be implemented through the Project's CEMP to minimise this risk of spreading disease to the species and the habitat they utilise. Considering the above, it is unlikely the Project will interfere with the recovery of Carnaby's Black-Cockatoo.

3.0 Forest Red-tailed Black-Cockatoo

Table I.1 Species Description: Forest Red-tailed Black-Cockatoo

Forest Red-tailed Black-Cockatoo *(Calyptorhynchus banksii naso)*	
Profile	**Conservation Status:** Cth: Vulnerable, WA: Vulnerable. **Habitat:** The Forest Red-tailed Black-Cockatoo inhabits the dense Jarrah (*Eucalyptus marginata*), Karri (*E. diversicolor*) and Marri (*Corymbia calophylla*) forests in the far southwest of WA. In the Wheatbelt region, they sometimes occupy Wandoo (*E. wandoo*), Salmon Gum (*E. salmonophloia*) or Gimlet (*E. salubris*) woodlands (BirdLife Australia, 2023). The species primarily feeds on Marri seeds followed by Jarrah (*E. marginata*) and less commonly Snottygobble (*Persoonia longifolia*), Common Sheoak (*Allocasuarina fraseriana*) and proteaceous shrubs. The subspecies does not regularly undertake seasonal movements like other species of Black-Cockatoo found in southwest WA and will primarily undertake movements in response to the availability of resources. They are also known to breed almost year-round, using hollows of mature trees as nesting sites (Johnstone et al., 2020). **Distribution:** The Forest Red-tailed Black-Cockatoo is endemic to south-west WA in an area bounded by Gingin, Mt Helena, Christmas Tree Well, West Dale (rarely to Brookton), North Bannister (rarely to Wandering), Mt Saddleback, Kojonup, Rocky Gully, upper King River and Green Range (east of Albany) (Garnett et al., 2011; Johnstone & Storr, 1998a). It is most common in the jarrah forest region of the northern Darling Range from about Collie north to Mundaring and is very local throughout the lower south-west (Garnett et al., 2011). **Previous Records:** Desktop database searches have not identified any records of the species in the Desktop Study Area. **Local and Regional Context:** As described in Section 6.3.2, within 12 km of the Project Area:

- There is approximately 40,010 ha of government mapped remnant native vegetation that potentially provides foraging habitat for Black-Cockatoos. Most of the vegetation associations provides higher potential foraging habitat for Carnaby's Black-Cockatoo relative to Forest Red-Tailed Black-Cockatoo. Of this area, approximately 12,592 ha is within conservation estate.
- One Black-Cockatoo confirmed breeding area mapped by DBCA (DBCA-063) is located approximately 6 km southeast of the Project Area.
- There is approximately 5,698 ha of remnant vegetation which is likely to contain vegetation that can support Black-Cockatoo breeding trees. Of these areas, approximately 348 ha is within conservation estate.
- There is one confirmed roost site, approximately 7 km south of the Project Area near Regans Ford.
- There is approximately 5,205 ha of remnant vegetation which is likely to contain vegetation that can support Black-Cockatoo roosting trees. Of these areas, approximately 348 ha is within conservation estate.

Habitat Critical to the Survival of the Species:

The Recovery Plan for Forest Black-Cockatoo (which includes the Forest Red-tailed Black-Cockatoo) (DEC, 2008) identifies habitat critical to survival of Forest Black-Cockatoos as areas that are:

- currently occupied by the cockatoos;
- not currently occupied by the cockatoos due to recent fire but capable of supporting cockatoo populations when sufficiently recovered;
- of natural vegetation in which the cockatoos nest, feed and roost;
- of natural vegetation through which the cockatoos can move from one occupied area to another; and
- of suitable vegetation within the recorded range in which undiscovered cockatoo populations may exist.

The Recovery Plan further states that habitat critical to survival and important populations of Forest Black-Cockatoos comprises all Marri (*Corymbia calophylla*), Karri (*Eucalyptus diversicolour*) and Jarrah (*Eucalyptus marginata)* forests, woodlands and remnants in the south-west of Western Australia receiving more than 600 mm of annual average rainfall.

Annual average rainfall in the Project Area is approximately 520 mm. As such, habitat in the Project Area is not considered critical to the survival of the species.

Important Populations:

Based on the species Conservation Advice (DEWHA, 2009), the Forest Red-tailed Black-Cockatoo occurs in one population of approximately 15,000 individuals distributed across the south-west forested regions of Western Australia. Because the subspecies is

Forest Red-tailed Black-Cockatoo *(Calyptorhynchus banksii naso)*	
	endemic to this region and restricted to mature jarrah, karri and marri forests, this population represents the entire breeding population and is therefore critical to the species' survival and recovery. Its restricted range (66,500 km^2) and dependence on hollow-bearing trees in a declining forest ecosystem make it particularly vulnerable to fragmentation, habitat loss, and reduced recruitment. As such, all subpopulations within the Jarrah–Marri–Karri forest belt are considered important. **Threats:** Key threats to the Forest Red-tailed Black-Cockatoo as identified in the SPRAT and Recovery Plan are: • Illegal shooting • Feral Honeybees (Apis mellifera) • Habitat loss and degradation • Nest hollow shortage • Competition for available nest hollows
In the Project Area	**Species Occurrence**: The Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*) was recorded on four occasions during the Winter 2025 BBUS and once during the targeted fauna habitat assessment undertaken in June 2025 **Appendix C**. Flock sizes ranged from two to eight individuals. The species was not recorded during the Spring 2024, Summer 2025, Autumn 2025 and Spring 2025 BBUS, indicating that it is an intermittent and transient visitor to the Project Area that occurs in small numbers when present. This is supported by the fact that the Project Area lies approximately 40km north of its documented range of distribution (see below). The species was not expected to occur within the Project Area. The species generally occurs to the south of the Project Area, where it ranges north to about Cullalla (north of Gingin), some 40 km to the south of the Project Area. Johnstone and Storr (1998b) noted that the range of this species *formerly* extended north to Dandaragan (but presently is expected to occur to the Gingin area; south of the Project Area). BirdLife Australia (2023) concurs with this distribution, as does the expected distribution mapping of DCCEEW (2025a). It is noted that the species was also found in small numbers during bird and bat surveys being undertaken for a separate wind farm proposed directly south of the Project Area. A description of foraging, breeding and roosting habitat values for Forest Red-tailed Black-Cockatoo in the Indicative Project Footprint, Development Corridor, and Project Area is provided in **Section 6.3.2**. A summary is provided below.

Forest Red-tailed Black-Cockatoo *(Calyptorhynchus banksii naso)*

Habitat:

Breeding

A full census survey of potential Black-Cockatoo nest-trees (Rank 1 – 5) was conducted across 697.9 ha (95.7%) of the Indicative Project Footprint utilising the (Bamford, 2020)methodology. A 'partial' survey (all Rank 1 – 3 trees, but only opportunistically surveyed for Rank 4 and 5 trees) was undertaken across 26 ha (3.6%) of the Indicative Project Footprint, with the remaining 5.1 ha (0.7%) not assessed. The unassessed areas are primarily cleared land devoid of trees.

A complete assessment of Rank 1 – 5 trees was completed over 2,596.6 ha (75.4%) of the Development Corridor, with 762.3 ha (22.1%) subject to a 'partial' survey. Eight-four (84) ha (2.5%) of the Development Corridor has not been assessed

In total 560 potential Black-Cockatoo nest trees were assessed in the Development Corridor and 112 in the Indicative Project Footprint, with the results presented in **Table 6.10**. A series of maps showing the locations of all trees assessed is provided in **Appendix C**.

No active nest-trees (Rank 1) were recorded in the Development Corridor.

Foraging

A broad-scale foraging habitat assessment for the Project Area identified approximately 467.5 ha of habitat with Moderate to high or High foraging value (site condition), including Marri Jarah Forest, Banksia Woodland, Low Shrubland habitat types. Other habitat types were assessed at a broad-scale as having Negligible, Low, Low to moderate, or Moderate foraging value.

Targeted Black-Cockatoo foraging habitat assessment was undertaken across 99.9% of the Development Corridor utilising the BCE(Bamford, 2020) site condition scoring methodology with the resultant mapping presented in **Appendix C**.

Almost 93% of the Development Corridor was assessed as having Low, Negligible or No foraging value (site condition) for Black-Cockatoos. Areas of Moderate or better foraging value were isolated and mostly occurred in the south-east of the Development Corridor. There were also narrow areas of higher-quality foraging along Walyer Walyer Road in the central-south area of the Development Corridor.

The foraging scores of vegetation (native, isolated remnant trees and planted) present within the Indicative Project Footprint for Forest Red-tailed Black-Cockatoo is presented in **Table 7.3**.

Roosting

No Forest Red-tailed Black-Cockatoo roost sites were observed in the Project Area.

Table I.2 Forest Red-tailed Black-Cockatoo Significant Impact Assessment

Criteria	Assessment of the Project
Lead to a long-term decrease in the size of an important population of a species.	The Project is unlikely to lead to a long-term decrease in the size of an important population based on: • the species being intermittently recorded in the Project Area and in low numbers • the lack of high-quality foraging value vegetation within the Indicative Project Footprint, with 55% being of no foraging value, and a total of 68% being of no, negligible, or low foraging value • avoiding Rank 1 and Rank 2 potential Black-Cockatoo nest-trees • adopting a minimum blade tip height of 59 m AGL that is above flight height range observed for the species. <u>Impact on habitat</u> The Project has sought to minimise the clearing of native vegetation as far as practicable, culminating in clearing limits of 10.28 ha of remnant native vegetation, 5.45 ha of isolated remnant trees in cleared agricultural land and 7.33 ha of planted vegetation (native and non-native). The foraging values of this vegetation to Forest Red-tailed Black-Cockatoo has been scored (Bamford, 2020) as follows: • 12.65 ha is of no foraging value • 0.21 ha is negligible to low foraging value • 2.76 ha is low foraging value • 3.08 ha is low to moderate foraging value • 3.27 ha is moderate foraging value • 0.03 ha is moderate to high foraging value • None is high foraging value • 1.05 ha has not been assessed but is likely low to moderate foraging value. A potential Black-Cockatoo nest-tree assessment recorded 560 potential nest-trees (DBH > 500 mm) within the Development Corridor, 112 of which lie in the Indicative Project Footprint. No active nests (Rank 1) were recorded within the Development Corridor, and although six Rank 2 and 19 Rank 3 trees were recorded in the Development Corridor at the time of survey, the Indicative Project Footprint has been designed to avoid clearing all Rank 2 trees and minimise clearing of Rank 3 trees. <u>Impact on individuals</u> The main risk posed to Forest Red-tailed Black-Cockatoo individuals as a result of the Project is turbine blade strike. To understand the level of this risk, BBUS surveys sought to capture site utilisation and flight characteristics of Forest Red-tailed Black-Cockatoos within the Project Area.

Criteria	Assessment of the Project
	Due to the low and intermittent observations of the species within the Project Area only one flight height was recorded, where the species reached a maximum flight height of 8m AGL. Based on similar flight behaviours to that of Carnaby's Black-Cockatoo and records from other studies, the species is unlikely to fly at RSA.
Reduce the area of occupancy of an important population.	The Forest Red-tailed Black-Cockatoo has an estimated area of occupancy between 6,600 km^2 to 8,800 km^2 (Johnstone et al., 2021). The Project Area lies approximately 40km North of the species documented distribution. There are no mapped roosting or breeding sites recorded for the Forest Red-tailed Black-Cockatoo within the Project Area using the publicly available DBCA roosting or breeding site datasets (DBCA, 2018, DBCA, 2019). The proposed clearing associated with the Project is limited to a small fraction of the total native vegetation within the surrounding landscape and primarily affects fragmented edge habitat rather than intact woodland. Similar and higher-quality habitat is extensively available within adjacent reserves such as Namming Nature Reserve and Moore River National Park. The proportion of potential Forest Red-tailed Black-Cockatoo foraging habitat proposed to be cleared represents less than 0.05 % of the native vegetation available within 12 km of the Project Area, based on regional vegetation mapping (DPIRD, 2025) and noting that the suitability of this foraging habitat is likely to be relatively lower for Forest Red-Tailed Black-Cockatoos relative to Carnaby's Black-Cockatoos. Given the species' highly mobile nature, extensive regional habitat availability, and the absence of localised roosts or breeding colonies within the Project Area, the clearing of fragmented foraging habitat is not likely to materially reduce the area of occupancy for the species.
Fragment an existing important population into two or more populations.	The Project Area is beyond the modelled range of the species. Records from the field survey program indicate that the Forest Red-tailed Black-Cockatoo is an intermittent and transient visitor to the Project Area and occurs in small numbers when present. Given this, it is considered unlikely that the Project would result in the fragmentation of populations of Forest Red-tailed Black-Cockatoo as a result of either collision risk, habitat loss, or altered movement patterns across the broader landscape.
Adversely affect habitat critical to the survival of a species.	The Project will result in the clearing of 10.28 ha of remnant native vegetation, 5.45 ha of isolated remnant trees and 7.33 ha of planted vegetation (native and non-native). Of this proposed clearing, no habitat has a high foraging value, 0.03 ha has a foraging value of moderate to high, and the remaining habitat has a foraging habitat value of moderate or below. A Black-Cockatoo potential nest-tree assessment has been completed for the majority (>99%) of the Indicative Project Footprint. The Project will avoid all Rank 1 and Rank 2 potential Black-Cockatoo nest-trees and the clearing of Rank 3 trees will be minimised.

Criteria	Assessment of the Project
	Habitat within the Project Area is not considered unique, and the removal of fragmented Forest Red-tailed Black-Cockatoo habitat (of which 55% is of no value, and the remainder mainly of low to moderate value or less) is considered to be minor relative to the area of similar or better quality native vegetation within 12 km of the Project Area.
Disrupt the breeding cycle of an important population.	A Black-Cockatoo potential nest-tree assessment has been completed for the majority (>99%) of the Indicative Project Footprint. The Project will avoid all Rank 1 and Rank 2 potential Black-Cockatoo nest-trees and the clearing of Rank 3 trees will be minimised. Furthermore no activities will be undertaken within 50 m of any hollow found to be actively in use by the species. Foraging habitat within the Project Area is already heavily fragmented, and proposed clearing is mainly confined to individual trees or edges of patches of degraded vegetation, over half of which has no foraging value and the remainder being mainly low to moderate foraging value or lower. No roost sites have been recorded and blade strike is expected to be unlikely due to the adoption of a minimum blade tip height of 59 mAGL which is above the flight heights observed for Carnaby's Black-Cockatoos which exhibit similar flight behaviours to that of Forest Red-tailed Black-Cockatoos. In consideration of the above, it is unlikely the Project would disrupt the breeding cycle of a population of Forest Red-Tailed Black-Cockatoo.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Forest Red-Tailed Black-Cockatoo habitat within the Project Area is heavily fragmented and proposed clearing is primarily restricted to individual trees or patches of vegetation at the perimeter of larger remnant patches which themselves are of degraded condition. Habitats within the broader region are likely to be more intact and of higher quality than habitats within the Project Area. The Project will result in the clearing of 0.03 ha of habitat with moderate to high value foraging habitat (Site condition 5), with remaining clearing being moderate or lower foraging habitat (Site condition 4 or lower). The Project will avoid all Rank 1 and Rank 2 potential Black-Cockatoo nest-trees and the clearing of Rank 3 trees will be minimised. The proposed clearing represents approximately 0.05% of similar or better-quality habitat within 12 km of the Project Area. This is a very low proportion of impact to habitat that is not unique in the area, is fragmented, and is relatively lower quality than the intact surrounding remnant native vegetation. Based on the above, it is considered unlikely that the permanent removal of vegetation or the operation of wind turbines will alter habitat to the extent where the species is likely to decline.
Result in invasive species that are harmful to a vulnerable	Introduced corellas (*Cacatua species*), galahs (*Cacatua roseicapilla*), Australian shelducks (*Tadorna tadornoides*), Australian wood ducks (*Chenonetta jubata*) and feral European honey bees (*Apis mellifera*) are recognised as natural competitors for nesting hollows used by Black-Cockatoo species (Johnstone et al., 2011; Johnstone, R.E. & Kirkby, T., 2008).

Criteria	Assessment of the Project
species becoming established in the vulnerable species' habitat.	Corellas, galahs, Australia shelducks and Australian Wood Duck have all been recorded in the Project Area as part of the field survey program, however Project activities are not expected to result in an increase to their local populations. No feral European honeybee activity or hives were recorded during the fauna surveys. Other invasive species identified within the broader Project Area include the Red Fox (Vulpes vulpes) and Laughing Kookaburra (*Dacelo novaeguineae*), but neither of these pose a direct ecological threat to Black-Cockatoo in terms of nesting or foraging competition. During construction, the highest potential for introduction or spread of invasive species will occur through the movement of vehicles, equipment, and materials. To mitigate this risk, strict vehicle and machinery hygiene protocols will be implemented as part of the Project's CEMP. This includes requirements for clean-down procedures prior to site entry, weed and pest inspections, and restrictions on importing fill or vegetation material from unverified sources. Construction personnel will also undergo environmental inductions that highlight biosecurity responsibilities and species protection measures. Considering the above, the Project is considered unlikely to result in invasive species becoming established within the Project Area that pose a threat to the Forest Red-tailed Black-Cockatoo.
Introduce disease that may cause the species to decline.	Infectious diseases such as beak and feather disease virus (BFDV), avian polyomavirus (APV) and chlamydophilosis may pose a threat to Forest Red-tailed Black-Cockatoo (DEWHA, 2005). The potential for these diseases to be spread as a result of Project activities is considered to be highly unlikely as the disease is primarily spread through transmission from infected birds or nesting material which may be exacerbated by the high concentrations of individuals congregating in areas and feeding by the public without proper sanitation of feeding areas. Phytophthora dieback, Marri canker disease and Marri shoot blight can pose a threat to Black-Cockatoo foraging and breeding species within the Project Area. No Forest Disease Risk Area for Phytophthora dieback mapped by DBCA are located near the Project Area. Marri canker disease and Marri shoot blight are caused by fungal pathogens. Both diseases have been causing a decline in Marri over a number of years and due to their impact on both reproductive and vegetative tissues, affect the capacity for these trees to provide foraging and breeding habitat for Black-Cockatoo species. While Marri canker disease is suspected to be endemic to southwest WA, Marri shoot blight is an introduced disease and no control or management options have been developed for WA (Marbus et al., 2011; Paap et al., 2012). The Project will implement standard biosecurity management practices to minimise the risk of introduction or spread of these diseases. Biosecurity management measures to manage the diseases identified above will include: • Ensuring all ground disturbing plant and equipment enter site clean and free of weeds or dieback

Criteria	Assessment of the Project
	• Ensuring any fill brought to site will be accompanied with a clean fill certificate. Where practicable, the fill should be from a quarry (i.e. not reused from another site) that has a Dieback Management Plan in place. Therefore, the Project is considered unlikely to result in the introduction of diseases that may cause the species to decline.
Interfere substantially with the recovery of the species.	Key threats to the Forest Red-tailed Black-Cockatoo as identified in the SPRAT and Recovery Plan are: • Illegal shooting • feral Honeybees (Apis mellifera) • Habitat loss and degradation • Nest hollow shortage • Competition for available nest hollows The Project will not involve any shooting activities and firearms will not be permitted on site as part of Project activities. Standard biosecurity measures will be implemented through the Project's CEMP and the Project is not expected to result in the increase of feral Honeybees on site. The Project will avoid all Rank 1 and Rank 2 Black-Cockatoo nest-trees, and clearing of Rank 3 trees will be minimised. No high-quality foraging value habitat will be cleared, with the majority of vegetation to be cleared assessed as being of low to moderate foraging value or lower.

4.0 Curlew Sandpiper

Table I.1 Species Description: Curlew Sandpiper

Curlew Sandpiper *(Calidris ferruginea)*	
Profile	**Conservation Status:** Cth: CR & MI, WA: Cr. **Habitat:** The Curlew Sandpiper is a non-breeding migrant to Australia. In Australia, they mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They have also been recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters and forage at the edges of shallow pools and drains of intertidal mudflats and sandy shores. Curlew Sandpipers generally roost on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands, occasionally roosting in dunes during very high tides and sometimes in saltmarsh (Higgins & Davies, 1996). **Distribution:** *Global distribution:* The Curlew Sandpiper breeds in the high Arctic of northern Siberia, from the Yamal Peninsula east to Kolyuchiskaya Gulf, Chukotka Peninsula, and the New Siberian Islands. It migrates along the East Asian-Australasian Flyway, passing through Europe, Africa, Central and South Asia, and Southeast Asia. During the non-breeding season, it occurs throughout Africa, South and Southeast Asia, and Australasia, including Australia (Higgins & Davies, 1996). The EOO of the species is estimated at 10,900,000 km^2 (range 10,400,000–11,400,000 km^2) and the AOO estimated at 8,000 km^2 (8,000–12,000 km^2) (Driessen, J et al., 2025). *Australian distribution* In Australia, the Curlew Sandpiper is widespread around coastal regions and occurs inland in smaller numbers. It is recorded in all states and territories during the non-breeding season, with some immature birds remaining year-round. Major concentrations occur in Western Australia at Port Hedland Saltworks, Eighty Mile Beach, Roebuck Bay, and Lake Macleod. It is also common along the coasts of Queensland, New South Wales, and Victoria (Higgins & Davies, 1996).

Curlew Sandpiper *(Calidris ferruginea)*

Approximately 60 per cent of the flyway population spend the non-breeding season in Australia (Driessen, J et al., 2025).

Previous Records:

Desktop database searches have identified at least three records of this species within the Desktop Study Area. One of these records lies within the Project Area and the other two lie approximately 3 km to the east.

Habitat Critical to the Survival of the Species:

The flyway population estimate for the Curlew Sandpiper is 120,000 individuals (van Swinderen, L et al., 2025).

An internationally important site for Curlew Sandpiper is one that regularly supports 1,200 individuals. A nationally important site is one that regularly supports 120 individuals. Any habitats on site that exceed these thresholds will be considered critical to the survival of the species. Four sites in Western Australia have recorded peak counts that exceed the international threshold criteria, these being Eighty Mile Beach, Roebuck Bay, Lake MacLeod and Dampier Saltworks (van Swinderen, L et al., 2025).

Important Populations:

An ecologically significant portion of the Australian population is >120 individuals (0.1% of the flyway population of 120,000 individuals) (van Swinderen, L et al., 2025) which is the EPBC nationally important habitat threshold (DoE 2017, pp. 9-10). This serves as the operative criterion in place of an 'important population' definition for migratory shorebirds.

Threats:

The main threats to Curlew Sandpiper as identified in the Conservation Advice for the species are:

- Habitat loss, fragmentation and degradation
- Anthropogenic disturbances
- Climate change, particularly increased frequency and length of droughts
- Exploitation
- Pollution

There is no adopted or made recovery plan for this subspecies (DCCEEW, 2025d).

Curlew Sandpiper *(Calidris ferruginea)*	
In the Project Area	**Species Occurrence:** Not recorded during the field survey program. **Habitat:** Migratory shorebirds such as the Curlew Sandpiper are known or considered likely to occur at four wetlands within the Project Area, as summarised in **Table 6.10** and mapped in **Figure 6.12**. Three of these wetlands are located adjacent to one another in the west of the Project Area, with the remaining site, Lake Yangy, is in the east. Whilst Lake Yangy was selected as a wetland where migratory shorebirds are likely to occur, due to its smaller size and lower habitat suitability in comparison to the other three wetlands, any presence of migratory shorebirds at this site would be expected to be of lower density and shorter durations.

Table I.2 Curlew Sandpiper Significant Impact Assessment

Criteria	Assessment of the Project
Lead to a long-term decrease in the size of a population.	The estimated population of Curlew Sandpiper in Australia during the non-breeding season is 120,000 individuals. No records of the species have been observed to date during the field survey program. Given the lack of detections within the Project Area and their preference for intertidal mudflats in sheltered coastal environments, the Project is unlikely to lead to a long-term decrease in the size of a population. Furthermore, the Project Area is not likely to support an important population of the species.
Reduce the area of occupancy of the species.	The Project is not likely to reduce the area of occupancy of the species. The Project Area does not include habitat identified as critical for the survival of the species, nor is it likely to support regular or high-density non-breeding populations of the Curlew Sandpiper. Although the species has not been recorded within the Project Area, a number of wetlands West of Brand Highway may provide suitable habitat for the species. Turbines have been setback 3.5km from these wetlands and habitat disturbance has been restricted to the temporary clearing of 1 ha of degraded fringing vegetation.
Fragment an existing population into two or more populations.	The Project is not likely to fragment an existing population into two or more populations. The Curlew Sandpiper has not been recorded within the Project Area and typically prefers intertidal mudflats in sheltered coastal environments. The Project will not remove, isolate, or substantially modify wetlands in the Project Area that may be more suitable, and no infrastructure will be constructed between the preferred coastal environment and the more suited wetlands within the Project Area.
Adversely affect habitat critical to the survival of a species.	The Project is not likely to affect habitat critical to the survival of the species and the Project Area is not likely to support habitat critical to survival of the species. Habitat critical to the survival of the Curlew Sandpiper is one that can support over 120 individuals. To date the species has not been observed during the field survey program. The wetlands and waterbodies within the Project Area also notably differ from the coastal habitats typically preferred by the species. No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat under the EPBC Act.
Disrupt the breeding cycle of a population.	The Project is not likely to disrupt the breeding cycle of a population. Curlew Sandpiper breed across Arctic Siberia in June-July, with no breeding taking place in Australia.
Modify, destroy, remove, isolate or decrease the	The Project is not likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

Criteria	Assessment of the Project
availability or quality of habitat to the extent that the species is likely to decline.	The Project is not likely to contain habitat critical to the survival of the species. The most suitable and preferred migratory shorebird habitat within the Project Area is confined to the three wetlands west of Brand Highway. The vegetation in and surrounding these wetlands has been mapped as being in Degraded and Completely Degraded condition. Direct impacts to this wetland habitat will be limited to the temporary disturbance of 1 ha of degraded fringe line habitat. The agricultural matrix where turbines are proposed is not considered suitable non-breeding habitat for the species, and the Project Area lies approximately 30km east of intertidal coastal mudflat habitats typically preferred by the species.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	The Project is not likely to result in the establishment of invasive species harmful to the Curlew Sandpiper. The Conservation Advice for the species lists invasion of mudflats and coastal saltmarshes by mangroves and cordgrass as threats. Mangroves and cordgrass are typically associated with coastal environments, and noting the Project is located 30 km from the coast, establishment of mangroves and cordgrass is highly unlikely. The Wildlife Conservation Plan for Migratory Shorebirds (DoE, 2015) lists a number of threats to migratory shorebirds such as introduced plant species and predation by invasive animals such as cats and foxes. These threats will be managed through implementation of the Project CEMP, which includes vehicle hygiene, weed and pest inspection requirements, clean-down procedures, and controls on imported fill.
Introduce disease that may cause the species to decline.	The Project is not expected to introduce diseases that may cause the species to decline. No diseases that may impact the species are identified in the Conservation Advice note for the species. The Project will not introduce livestock, poultry, or aquaculture, which are typically associated with disease transmission risk to waterbirds, and the species has not been recorded to date during the field survey program.
Interfere with the recovery of the species.	The Project is not likely to interfere with the recovery of the species. There is no adopted or made Recovery Plan in place for this species (DCCEEW, 2025b). Management and recovery actions are instead implemented through the EPBC Wildlife Conservation Plan for Migratory Shorebirds and EPBC Policy 3.21, which prioritise the protection of high-value non-breeding wetlands, maintenance of habitat networks, and minimisation of disturbance across feeding and roosting sites (DoEE, 2017) No Curlew Sandpipers were detected during targeted surveys, and the species typically prefers intertidal mudflats in sheltered coastal areas which can be found 30km to the West of the Project Area.

5.0 Black-tailed Godwit

Table I.1 Species Description: Black-tailed Godwit

Black-tailed Godwit (*Limosa limosa*)	
Profile	**Conservation Status:** Cth: En & MI, WA:MI **Habitat:** The Black-tailed Godwit is a non-breeding migrant to Australia. In Australia the Black-tailed Godwit occupies a primarily coastal habitat environment. The species is commonly found in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit; occasionally recorded on rocky coasts or coral islets. It is also found in shallow and sparsely vegetated near coastal wetlands, such as saltmarsh, salt flats, river pools, swamps, lagoons and floodplains. There are a few inland records, around shallow, freshwater and saline lakes, swamps, dams and bore-overflows. They also use lagoons in sewage farms and saltworks (Higgins & Davies, 1996). **Distribution:** *Global distribution:* The black-tailed godwit has a large discontinuous breeding range extending from Iceland to the Russian Far East. For populations occurring in the East Asian - Australasian Flyway, breeding occurs mostly in the Russian Far East. Wintering populations occur throughout Europe, Africa, the Middle East, and Australasia (DCCEEW, 2024b). The extent of occurrence (EOO) is estimated at 9,400,000 km^2 (range 8,900,000–9,900,000 km^2) and the area of occupancy (AOO) is estimated at 13,000 km^2 (13,000–20,000 km^2). Clemens et al. (2021) considers the species' EOO and AOO to be stable(DCCEEW, 2024b). *Australian distribution:* During the Austral summer non-breeding season, Black-tailed Godwits are found in all states and territories of Australia, however, coastal regions support the highest densities of the species. The largest populations are found on the north coast between Darwin and Weipa. The species is generally found in small numbers elsewhere, including scattered inland records (Watkins, 1993).

Black-tailed Godwit (*Limosa limosa*)	
	Previous Records: Desktop assessment (BirdLife) indicates previous records of the species near the Project Area and within 20km buffer (Umwelt, 2025e). **Habitat Critical to the Survival of the Species:** The flyway population estimate for the Black-tailed Godwit is 230,000 individuals (Driessen, J et al., 2025). An internationally important site for the Black-tailed Godwit is one that regularly supports 2,300 individuals or 1% of the total population estimate. A nationally important site is one that regularly supports 230 individuals. Any habitats on site that exceed these criteria will be considered critical to the survival of the species. In Western Australia, one site has recorded a peak count that meets the international criteria (Roebuck Bay) and one site has recorded a peak count that meets the national criteria (Eighty Mile Beach). Both sites are over 1,300 km from the Project. No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat. **Important Populations:** An ecologically significant portion of the Australian population is >230 individuals (0.1% of the flyway population of 230,000 individuals; Driessen et al. 2025), which is the EPBC nationally important habitat threshold (DoE 2017, pp. 9-10). This serves as the operative criterion in place of an 'important population' definition for migratory shorebirds. **Threats:** The main threats to Black-tailed Godwit as identified in the Conservation Advice for the species are: • Habitat loss, fragmentation and degradation. • Climate change • Invasive species • Exploitation • Pollution There is no adopted or made recovery plan for this subspecies.
In the Project Area	**Species Occurrence:** A single Black-tailed Godwit was observed once during the Summer 2025 BBUS event at a wetland west of Brand Highway (**Figure 6.8**).

Black-tailed Godwit (*Limosa limosa*)

Habitat:

Migratory shorebirds such as the Black-tailed Godwit are known or considered likely to occur at four of the Project Area wetlands (two lakes and two sumplands), as summarised in **Table 6.14** and mapped in **Figure 6.12**. Three of these sites are located adjacent to one another in the west of the Project Area, with the remaining site, Lake Yangy, in the east. Whilst Lake Yangy was selected as a wetland where migratory shorebirds are likely to occur, due to its smaller size and lower habitat suitability in comparison to the other three wetlands, any presence of migratory shorebirds at this site would be expected to be of lower density and shorter durations.

Table I.2 Black-tailed Godwit Significant Impact Assessment

Criteria	Significant Impact Assessment
Lead to a long-term decrease in the size of a population.	The Project Area is not likely to support an important population of the species as the number of individuals recorded to date is well below the 0.1% flyway population of >230 individuals. The species was only recorded once during the Summer 2025 BBUS survey, whereby a single individual was recorded. Although it is possible that greater numbers may occur during peak periods, the species typically occur in low densities in these environments (Higgins & Davies, 1996)and are expected to be below the 0.1% flyway population. Turbines have been setback over 3.5km from the wetlands west of Brand Highway where the species was recorded, thereby minimising potential for direct mortality through blade strike. Noting wetlands in the Project Area are unlikely to support an important population, and turbines have been setback over 3.5 km from the more suitable wetlands, the Project is unlikely to result in a long-term decrease in the size of a population.
Reduce the area of occupancy of the species.	The area of occupancy for the species is estimated at 13,000 km^2. The Project Area is 156 km^2 and the Indicative Project Footprint covers an area of 7.3 km^2 The combined area of the four wetlands within the Project Area known or likely to support migratory shorebirds is 2.8 km^2. There will be no permanent clearing of these wetlands, and temporary clearing will limited to 1 ha (0.01 km^2) of fringing vegetation adjacent to wetlands. This temporary reduction of 1 ha (0.01 km^2) is not likely to materially impact the area of occupancy of the species.
Fragment an existing population into two or more populations.	The Project is not likely to fragment an existing population into two or more populations. Fragmentation of a population occurs where an action interrupts the movement or connectivity of a population that is already using an area in a regular or functionally important way (Andren, 1994; Animal Nepal Editorial Staff, 2024). The Project Area is not likely to support regular or high-density populations, and only a single individual has been recorded during the Summer 2025 BBUS, in one of the wetlands west of Brand Highway. Furthermore, no infrastructure is proposed to be constructed between the species preferred coastal environment and the more suitable wetlands within the Project Area.
Adversely affect habitat critical to the survival of a species.	Habitat critical to the survival of the Black-tailed Godwit is one that can regularly support over 230 individuals. To date only one individual has been recorded on a single occasion within the Project Area, and as the species tends to occur in smaller numbers inland (Watkins, 1993), presence in the Project Area is expected to be below the 0.1% flyway population.

Criteria	Significant Impact Assessment
	Furthermore, direct habitat impact will be restricted to the temporary clearing of 1 ha of fringing habitat adjacent to a wetland, which accounts for 0.36% of the most suitable habitat within the Project Area. As the Project Area is unlikely to contain habitat critical to the survival of the species, and habitat loss will be negligible, the Project is not likely to affect habitat critical to the survival of the species.
Disrupt the breeding cycle of a population.	The Project is not likely to disrupt the breeding cycle of a population. This species does not breed in Australia as all Australian individuals are non-breeding migrants (Higgins & Davies, 1996).
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Habitat loss and modification as a result of the Project will be limited to the temporary clearing of 1 ha of degraded fringeline wetland habitat, which accounts for 0.36% of the most suitable habitat within the Project Area. As a result of this, the Project is not likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	The Project is not likely to result in the establishment of invasive species harmful to Black-tailed Godwit The Conservation Advice for the species lists invasion of mudflats and coastal saltmarshes by mangroves and cordgrass as threats. Mangroves and cordgrass are typically associated with coastal environments, and noting the Project is located 30 km from the coast, establishment of mangroves and cordgrass is highly unlikely. The Wildlife Conservation Plan for Migratory Shorebirds (Department of the Environment, 2015) lists a number of threats to migratory shorebirds such as introduced plant species and predation by invasive animals such as cats and foxes. These threats will be managed through implementation of the Project CEMP, which includes vehicle hygiene, weed and pest inspection requirements, clean-down procedures, and controls on imported fill.
Introduce disease that may cause the species to decline.	The Project is not likely to introduce diseases that may cause the species to decline. No diseases that may impact the species are identified in the Conservation Advice, SPRAT and Migratory Shorebird Guidelines (DCCEEW, 2023b, 2024a; DoEE, 2017). No activities are proposed that would artificially concentrate birds (e.g., supplementary feeding, artificial freshwater provision) or reduce habitat availability to the extent that crowding would occur. Water quality within nearby wetlands will be maintained,

Criteria	Significant Impact Assessment
	and standard erosion and runoff controls will prevent nutrient enrichment that could otherwise increase pathogen persistence (DoE, 2021).
Interfere with the recovery of the species.	The Project is not likely to interfere with the recovery of the species. There is no adopted or made Recovery Plan for the Black-tailed Godwit under the EPBC Act. However, recovery and management guidance is provided through the species' Conservation Advice, which identifies the protection of major non-breeding coastal and estuarine habitats and the maintenance of migration stopover connectivity along the East Asian-Australasian Flyway as the key mechanisms supporting population persistence (Hansen et al., 2016). The Project Area does not contain these habitat types, nor does it support regular non-breeding aggregations of the species, with only a single individual recorded during surveys (Umwelt, 2025c).

6.0 Common Greenshank

Table I.1 Species Description: Common Greenshank

Common Greenshank (*Tringa nebularia*)	
Profile	**Conservation Status:** Cth: En &Mi, WA: Mi **Habitat:** The Common Greenshank does not breed in Australia; however, the species occurs in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity (Higgins & Davies, 1996). It forages at the edge of wetlands, in soft mud on mudflats, in channels, or within shallows around the edge of waterbodies. These locations are often situated near or among mangroves or other sparse, emergent or fringing vegetation such as sedges or saltmarsh. Common Greenshanks roost both on the coast and inland, in estuaries and mudflats, mangrove swamps and lagoons, and in billabongs, swamps, sewage farms, and flooded crops (BirdLife International, 2025). **Distribution:** *Global distribution:* The Common Greenshank has extensive breeding grounds. They extend from the northern British Isles, Scandinavia, east Estonia and north-east Belarus, and east through Russia. Outside of its breeding range, the species is widespread. It is found in Europe, Africa, Asia, Melanesia, and Australasia (DCCEEW, 2024c). The EOO for the species is estimated at 10,200,000 km^2 (range 9,700,000–10,700,000 km^2) and AOO at 13,000 km^2 (13,000–20,000 km^2). Both the EOO and AOO are considered stable (Clemens et al. 2021). Approximately 17% of the flyway population spend the non-breeding season in Australia (Driessen et al. 2025). *Australian distribution:* The Common Greenshank is widespread in coastal regions, occurs in all types of wetlands, and has one of the widest distribution of any shorebird in Australia (Higgins & Davies, 1996). In Western Australia, it occurs around most of the coast from Cape Arid in the south to Carnarvon in the north-west. In the Kimberley, it is recorded in the south-west and the northeast, with isolated records from the Bonaparte Archipelago (Higgins & Davies, 1996).

Common Greenshank (*Tringa nebularia*)

Previous Records:

Desktop database searches have identified seven records of this species within the Desktop Study Area. Three of these records lie within the Project Area, in the wetlands west of Brand Hwy.

Habitat Critical to the Survival of the Species:

The flyway population estimate for the Common Greenshank is 110,000 individuals (Driessen et al. 2025).

An internationally important site for Common Greenshank is one that regularly supports 1,100 individuals. A nationally important site is one that regularly supports 110 individuals. Any habitats on site that exceed these criteria will be considered critical to the survival of the species.

One site at Eighty Mile Beach in Western Australia has recorded peak counts that exceed the internationally important criteria. Seven sites in Western Australia have recorded peak counts that exceed the nationally significant criteria. The nearest one of these is the Peel and Yalgorup Lakes which is over 200km South of the Project Area (Driessen et al. 2025)

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or

included in the Register of Critical Habitat.

Important Populations:

An ecologically significant portion of the Australian population is >110 individuals (0.1% of the flyway population of 110,000 individuals) (Driessen et al. 2025) which is the EPBC nationally important habitat threshold. This serves as the operative criterion in place of an 'important population' definition for migratory shorebirds.

Threats:

The main threats to Common Greenshank as identified in the Conservation Advice for the species are:

- Habitat loss, degradation, and fragmentation
- Anthropogenic disturbance
- Climate change
- Invasive species
- Exploitation
- Pollution

Common Greenshank (*Tringa nebularia*)	
	There is no adopted or made recovery plan for this subspecies (DCCEEW, 2024c).
In the Project Area	**Species Occurrence:** A single Common Greenshank was recorded during the Summer 2025 BBUS event at a wetland west of Brand Highway. **Habitat:** Migratory shorebirds such as the Common Greenshank are known or considered likely to occur at four of the Project Area wetlands (two lakes and two sumplands), as summarised in **Table 6.14** and mapped in **Figure 6.12**. Three of these wetlands are adjacent to one another in the west of the Project Area and are located 3.5 km from the nearest turbine. The pH of these wetlands was measured on 23 September 2025 with their values ranging 8.38 to 8.74. A pH in the range of 6.5 to 9.0 is considered ideal for freshwater aquatic organisms which the shorebirds may feed on (ANZECC 1992, CCREM 1991, Alabaster & Lloyd 1982, USEPA 1986). The fourth wetland is Lake Yangy found in the eastern part of the Project Area. Due to its smaller size, higher pH of 11.54 (measured on 23 September 2025) which is unlikely to provide favourable foraging resources resulting in lower habitat suitability, it is therefore less likely to attract notable numbers of migratory shorebirds, with any presence also expected to be of shorter duration.

Table I.2 Common Greenshank Significant Impact Assessment

Criteria	Assessment of the Project
Lead to a long-term decrease in the size of a population.	The Project Area is unlikely to support an important population of the species as the number of individuals recorded to date is well below the 0.1% flyway population of 110 individuals. Within the Project Area, a single individual of the species was recorded during the Summer 2025 BBUS survey, indicating intermittent and low-density use of seasonal wetland habitats. Although it is possible that greater numbers may occur during peak periods, the species does not typically form large foraging flocks in this region and habitat type and are not expected to exceed the 0.1% flyway population within the Project Area. Turbines have been positioned more than 3.5 km from the wetlands located west of Brand Highway, where the species was observed, thereby reducing the risk of direct mortality due to blade strike. Noting wetlands in the Project Area are unlikely to support an important population, and turbines have been setback over 3.5 km from the more suitable wetlands, the Project is not likely to result in a long-term decrease in the size of a population.
Reduce the area of occupancy of the species.	The AOO for the species is estimated at 13,000 km^2. The Project Area is 156 km^2 and the Indicative Project Footprint covers an area of 7.3 km^2 The combined area of the four wetlands within the Project Area known or likely to support migratory shorebirds is 2.8 km^2. There will be no permanent clearing of these wetlands, and temporary clearing will be limited to 1 ha (0.01 km^2) of fringing vegetation adjacent to wetlands. This temporary reduction of 1 ha (0.01 km^2) is not likely to materially impact the area of occupancy of the species.
Fragment an existing population into two or more populations.	The Project is not likely to fragment an existing population into two or more populations. Fragmentation occurs where an action interrupts the movement or connectivity of a population that is already using an area in a regular or functionally important way (Andren, 1994; Animal Nepal Editorial Staff, 2024). The Common Greenshank is a highly mobile non-breeding migrant that relies on a wide network of coastal and inland wetlands during the austral summer (Higgins & Davies, 1996). Only a single individual was observed during the Summer 2025 BBUS in one of the wetlands west of Brand Highway, indicating low density usage of wetlands in the Project Area.
Adversely affect habitat critical to the survival of a species.	Habitat critical to the survival of the Common Greenshank is one that can support over 110 individuals. To date only one individual has been recorded on a single occasion within the Project Area. There is no habitat formally identified as critical to the survival of the Common Greenshank under the EPBC Act Register of Critical Habitat.

Criteria	Assessment of the Project
	Direct habitat impact will be restricted to the temporary clearing of 1 ha of wetland habitat, with this clearing being an area outside the wetland habitat suitable for shorebirds, which accounts for 0.36% of the most suitable habitat within the Project Area. As the Project Area is unlikely to contain habitat critical to the survival of the species, and habitat loss will be negligible, the Project is not likely to affect habitat critical to the survival of the species.
Disrupt the breeding cycle of a population.	The Project is not likely to disrupt the breeding cycle of a population. The Common Greenshank does not breed in Australia. Breeding occurs in northern Eurasia, and individuals migrate south to Australia during the non-breeding season.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Migratory shorebird habitat loss and modification as a result of the Project will be limited to the temporary clearing of 1 ha of degraded fringeline wetland habitat, which accounts for 0.36% of the most suitable habitat within the Project Area. The vegetation in and surrounding the wetland has been mapped as being in Degraded and Completely Degraded condition. Due to the minimal and temporary nature of the clearing, the Project is not likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	The Project is not likely to result in the establishment of invasive species harmful to the Common Greenshank. The Conservation Advice for the species lists invasion of mudflats and coastal saltmarshes by mangroves and cordgrass as threats. Mangroves and cordgrass are typically associated with coastal environments, and noting the Project is located 30 km from the coast, establishment of mangroves and cordgrass is highly unlikely. The Wildlife Conservation Plan for Migratory Shorebirds (DoE, 2015) lists a number of threats to migratory shorebirds such as introduced plant species and predation by invasive animals such as cats and foxes. These threats will be managed through implementation of the Project CEMP, which includes vehicle hygiene, weed and pest inspection requirements, clean-down procedures, and controls on imported fill.
Introduce disease that may cause the species to decline.	The Project is not likely to introduce diseases that may cause the species to decline. No diseases that may impact the species are identified in the Conservation Advice note for the species. The Common Greenshank does not breed within the Project Area and the species use of inland wetlands appears to be of low density. The Project will not introduce livestock, poultry, or aquaculture, which are typically associated with disease transmission risk to waterbirds, and the species does not rely on population-dense communal roosts at the site where disease spread could be facilitated.

Criteria	Assessment of the Project
Interfere with the recovery of the species.	The Project is not likely to interfere with the recovery of the species. There is no adopted or made Recovery Plan for the Common Greenshank under the EPBC Act. However, its Conservation Advice identifies the protection of key coastal non-breeding and migratory staging habitats across the East Asian–Australasian Flyway as central to sustaining the species' global population (DCCEEW, 2024c). The wetlands within the Project Area are small, inland and seasonal, and the species has only been recorded in very low numbers, indicating it is not a site of national significance.

7.0 Sharp-tailed Sandpiper

Table I.1 Species Description: Sharp-tailed Sandpiper

Sharp-tailed Sandpiper *(Calidris acuminata)*	
Profile	**Conservation Status:** Cth: Vu &Mi, WA: Mi. **Habitat:** The Sharp-tailed Sandpiper is a non-breeding migrant to Australia. In Australia, they prefer muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland and have been recorded on saltworks and sewage farms. They have been recorded on flooded paddocks, sedgelands and other ephemeral wetlands, leaving when they dry. Other habitats include intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. Sometimes they occur on rocky shores and rarely on exposed reefs (Higgins & Davies, 1996). **Distribution:** *Global distribution:* The Sharp-tailed Sandpiper breeds in northern Siberia, from the Lena River delta east to the Kolyma River delta. During migration, it passes through eastern Asia, including Mongolia, China, Korea, Japan, and Southeast Asia, with smaller numbers recorded in Alaska and occasional vagrants in Europe and the Pacific (Higgins & Davies, 1996) The EOO is estimated at 10,900,000 km^2 (range 10,400,000–11,400,000 km^2) and the AOO at 13,000 km^2 (13,000–20,000 km^2). *Australian distribution:* During the non-breeding season, the Sharp-tailed Sandpiper occurs throughout Australia and in small numbers in New Zealand. The species is most common in south-eastern Australia and occupies both coastal and inland freshwater or saline wetlands. It is widespread across all states and territories, including northern coastal areas of the NT, southern and coastal WA, eastern SA, and throughout NSW, Victoria, Queensland, and Tasmania (Higgins & Davies, 1996). **Previous Records:** Desktop database searches have identified at least two historic records of this species within the Project Area.

Sharp-tailed Sandpiper *(Calidris acuminata)*

Habitat Critical to the Survival of the Species:

The flyway population estimate for the Sharp-tailed is 130,000 individuals (Driessen et al. 2025).

An internationally important site for the Sharp-tailed Sandpiper is one that regularly supports 1,300 individuals. A nationally important site is one that regularly supports 130 individuals.

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat.

In Western Australia, six sites have recorded a peak count that meets the international criteria, with the nearest one being Peel and Yalgorup Lakes which are located over 200 km south of the Project Area.

Important Populations:

An ecologically significant portion of the Australian population is >130 individuals (0.1% of the flyway population of 130,000 individuals) (Hansen et al., 2016) which is the EPBC nationally important habitat threshold. This serves as the operative criterion in place of an 'important population' definition for migratory shorebirds.

Threats:

The main threats to Common Greenshank as identified in the Conservation Advice for the species are:

- Habitat loss, degradation, and fragmentation
- Climate change, most notably the increasing frequency and severity of droughts
- Invasive species
- Pollution
- Exploitation

There is no adopted or made recovery plan for this subspecies (DCCEEW, 2025c).

In the Project Area

Species Occurrence:

Five individuals of Sharp-tailed Sandpiper were observed once during the Summer 2025 BBUS event at a wetland west of Brand Highway.

Sharp-tailed Sandpiper *(Calidris acuminata)*	
	Habitat: Migratory shorebirds such as the Sharp-tailed Sandpiper are known or considered likely to occur at four of the Project Area wetlands (two lakes and two sumplands), as summarised in **Table 6.14** and mapped in **Figure 6.12**. Three of these sites are located adjacent to one another in the west of the Project Area, with the remaining site, Lake Yangy, in the east. Whilst Lake Yangy was selected as a wetland where migratory shorebirds are likely to occur, due to its smaller size and lower habitat suitability in comparison to the other three wetlands, any presence of migratory shorebirds at this site would be expected to be of lower density and shorter durations.

Table I.2 Sharp-tailed Sandpiper Significant Impact Assessment

Criteria	Assessment of the Project
Lead to a long-term decrease in the size of an important population of a species.	The Project Area is unlikely to support an important population of the species as the number of individuals recorded to date is well below the 0.1% flyway population of 130 individuals. The species was only recorded once during the Summer 2025 BBUS survey, whereby five individuals were recorded. Knowledge of the species indicates that greater numbers may occur within the more suitable wetlands in the Project Area and monthly surveys are being undertaken to understand if any of these wetlands may support an important population. The main threat the Project poses to population size is direct mortality through blade strike. Noting the more suitable wetlands to support the species are located west of Brand Highway, turbines have been setback 3.5k km from these to minimise the risk or blade strike. Migratory shorebird habitat clearing has been restricted to the temporary clearing of 1 ha of degraded fringing habitat that is unlikely to contain foraging material. Noting the turbine setbacks adopted and negligible habitat clearing, the Project is not likely to lead to a long-term decrease in the size of an important population of a species.
Reduce the area of occupancy of an important population.	The AOO for the species is estimated at 13,000 km^2. The Project Area is 156 km^2 and the Indicative Project Footprint covers an area of 7.3 km^2 The combined area of the four wetlands within the Project Area known or likely to support migratory shorebirds is 2.8 km^2. There will be no permanent clearing of these wetlands, and temporary clearing will limited to 1 ha (0.01 km^2) of fringing vegetation that is unlikely to contain foraging material. This temporary reduction of 1 ha (0.01 km^2) is not likely to materially impact the area of occupancy of the species.
Fragment an existing important population into two or more populations.	The modelled distribution of the species shows they occur throughout Australia and are widespread in both inland and coastal locations. The species also occurs in both freshwater and saline habitats (Cramp 1985, Higgins& Davies 1996). Noting they are a highly mobile species that can utilise a variety of habitats in the broader region, the Project is not likely to fragment an existing important population into two or more populations.
Adversely affect habitat critical to the survival of a species.	Habitat critical to the survival of the Sharp-tailed Sandpiper is one that can support over 130 individuals. To date only five individuals have been recorded on a single occasion within the Project Area. There is no habitat formally identified as critical to the survival of the Sharp-tailed Sandpiper under the EPBC Act Register of Critical Habitat. Direct habitat impact will be restricted to the temporary clearing of 1 ha of degraded fringing wetland habitat, which accounts for 0.36% of the most suitable habitat within the Project Area.

Criteria	Assessment of the Project
	Noting there will be no permanent clearing of wetland habitat, and temporary clearing will be restricted to 1 ha of degraded fringing habitat that is unlikely to contain foraging material, the Project is not likely to affect habitat critical to the survival of the species. Furthermore, higher-quality wetlands (e.g., Lake Guraga, Namming Lake) are present in the broader landscape and likely provide greater habitat values.
Disrupt the breeding cycle of an important population.	The Project is not likely to disrupt the breeding cycle of an important population. The Sharp-tailed Sandpiper breeds in the Siberian Arctic, with no breeding activity occurring in Australia (Higgins & Davies, 1996). Individuals present in Australia during the austral summer are in the non-breeding phase of their annual cycle and use wetlands only for foraging and roosting.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Migratory shorebird habitat loss and modification as a result of the Project will be limited to the temporary clearing of 1 ha of degraded fringing wetland habitat which is unlikely to contain foraging material, which accounts for 0.36% of the most suitable habitat within the Project Area. The vegetation in and surrounding the wetland has been mapped as being in Degraded and Completely Degraded condition. Due to the minimal and temporary nature of the clearing, the Project is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The Project is not likely to result in the establishment of invasive species harmful to the Sharp-tailed Sandpiper. The Conservation Advice for the species lists invasion of mudflats and coastal saltmarshes by mangroves and cordgrass as threats. Mangroves and cordgrass are typically associated with coastal environments, and noting the Project is located 30 km from the coast, establishment of mangroves and cordgrass is highly unlikely. The Wildlife Conservation Plan for Migratory Shorebirds (DoE, 2015) lists a number of threats to migratory shorebirds such as introduced plant species and predation by invasive animals such as cats and foxes. These threats will be managed through implementation of the Project CEMP, which includes vehicle hygiene, weed and pest inspection requirements, clean-down procedures, and controls on imported fill.
Introduce disease that may cause the species to decline.	The Project is not likely to introduce diseases that may cause the species to decline. No diseases that may impact the species are identified in the species Conservation Advice, SPRAT and Migratory Shorebird Guidelines. No activities are proposed that would artificially concentrate birds (e.g., supplementary feeding, artificial freshwater provision) or reduce habitat availability to the extent that crowding would occur. Water quality within nearby wetlands will be maintained, and standard erosion and runoff controls will prevent nutrient enrichment that could otherwise increase pathogen persistence (DoE, 2021)

Criteria	Assessment of the Project
	Noting the above, and through the implementation of standard biosecurity and hygiene measures, the Project is not likely to introduce disease that would cause a decline in the species.
Interfere substantially with the recovery of the species.	The Project is unlikely to interfere substantially with the recovery of the species. There is no adopted or made Recovery Plan for the Sharp-tailed Sandpiper under the EPBC Act. Current national and international conservation guidance emphasises the protection of major coastal and inland wetland systems, particularly large floodplain wetlands, and the maintenance of habitat availability along the East Asian-Australasian Flyway (Dhanjal-Adams et al., 2019; Jackson et al., 2019). Given clearing of suitable wetland habitat will be temporary and limited to 1 ha of degraded habitat, and noting turbines have been setback 3.5 km from the most suitable wetlands in the Project Area, the Project is not likely to interfere substantially with the recovery of the Sharp-tailed Sandpiper.

8.0 Migratory Species

Table I.1 Species Description: Migratory Species

Species	Habitat	Distribution	Previous Records	Habitat Critical to the Survival of the Species	Important Population	Threats
Red-necked Stint *(Calidris ruficollis)*	The Red-necked Stint is a non-breeding migrant to Australia, mostly found in coastal areas. The species has also been recorded on ephemeral or permanent shallow wetlands near the coast or inland. Mostly forage on bare wet mud on intertidal mudflats or sandflats, or in very shallow water.	Widely distributed around the Australian coastline during the non-breeding season with large densities on the Victorian and Tasmanian coasts. Also occurs inland when temporary wetlands provide suitable conditions (Higgins & Davies, 1996).	There are at least five records of this species within the Desktop Study Area. Two of these records lie within the Project Area, and the other three lie within 3 km of the Fauna Survey Area.	One that can support >600 individuals (0.1% of flyway population)	600	Habitat loss Habitat degradation Disturbance Direct mortality
Ruff (*Calidris pugnax*)	The Ruff is generally found in fresh, brackish or saline wetlands with exposed mudflats at the edges.	Rare but regular non-breeding visitor to Australia, recorded in all States and Territories, generally in low numbers and often at freshwater or brackish wetlands. It is most frequently observed in eastern Australia, particularly around coastal and inland wetlands in Queensland, New South Wales and Victoria. In Western Australia it is mostly found in the south-west region of the state.	Desktop database search (BirdLife) recorded the Ruff within the Project Area and Desktop Study Area.	One that can support >0.75 individuals (0.1% of flyway population)*	1	Habitat loss Habitat degradation Disturbance Direct mortality
Wood Sandpiper (*Tringa glareola*)	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They have also been known to frequent inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding	The species is a migratory wader that is recorded in Australia as a non-breeding visitor. Its largest numbers occur in north-west Western Australia, with nationally important site including Parry Floodplain, Camballin, Lake Argyle, Shark Bay, Vasse–Wonnerup, Lake McLarty and Kogolup Lakes (Watkins, 1993).	There are three records of this species within the Desktop Survey Area. Two of these records lie within the Project Area.	One that can support >130 individuals (0.1% of flyway population)	130	Habitat loss Habitat degradation Disturbance Direct mortality
Common Sandpiper (*Actitis hypoleucos)*	The Common Sandpiper is a non-breeding visitor to Australia and can be found along all Australian coastlines and many inland areas. The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats (Geering et al., 2007; Higgins & Davies, 1996).	The Common Sandpiper is widespread in small numbers, found along all coastlines of Australia and in many areas inland. The population when in Australia is concentrated in northern and western Australia (Higgins & Davies, 1996). Areas of national importance in WA are Nuytsland Nature Reserve and Roebuck Bay.	One record of this species occurs within the Desktop Study Area. The location of this record was provided by NatureMap (2024), and therefore spatial data is unavailable.	One that can support >190 individuals (0.1% of flyway population)	190	Human activities (habitat changes, regulation of rivers, pollution, use of pesticides) Habitat loss Reduction of quality and quantity of water Global warming
Glossy Ibis (*Plegadis falcinellus*)	The Glossy Ibis preferred habitat for foraging and breeding are freshwater marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as	In Australia, the Glossy Ibis is found mainly east of the Kimberley region in Western Australia and the Eyre Peninsula in South Australia, with patchy occurrences throughout the remainder of Western Australia.	There are at least three records of this species within the Desktop Study Area. Two of these records lie within the Project Area	One that can support >144 individuals (0.1% of the flyway population)**.	144	Wetland destruction or degradation Habitat modification (Clearing, grazing, burning, increased salinity, groundwater extraction and invasion by exotic plants and fish) Human disturbance

Species	Habitat	Distribution	Previous Records	Habitat Critical to the Survival of the Species	Important Population	Threats
	estuaries, deltas, saltmarshes and coastal lagoons					
Pacific Golden Plover (*Pluvialis fulva*)	The Pacific Golden Plover is widespread in coastal regions. In non-breeding grounds in Australia, they usually inhabit coastal habitats, and occasionally around inland wetlands	The species is present at non-breeding grounds in Australia mostly between September and May. Widespread along coastal regions, particularly in Queensland and New South Wales, with smaller populations in Victoria, Tasmania, South Australia, and northern Western Australia (Marchant & Higgins, 1993). A single nationally important site occurs in WA, at Eighty Mile Beach (Watkins, 1993).	There is one record of this species within the Desktop Study Area. This record occurs within the Project Area and is dated from 1991.	One that can support >150 individuals (0.1% of flyway population)	150	No threats specific to the species have been identified in the Species Profile and Threats database. However, there are a number of threats that will affect all migratory waders, such as pollution, human disturbance from recreational activities and introduced plants.
Long-toed Stint (*Calidris subminuta*)	The Long-toed Stint is a summer visitor to Australia where it occurs in a variety of terrestrial wetlands. The species prefer shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. The species forages on wet mud or in shallow water, often among short grass, weeds and other vegetation on islets or around the edges of wetlands.	The species is a regular summer visitor, occurring mainly across northern and western regions and less commonly in the east (Higgins & Davies, 1996). The species is widespread along the Western Australian coast, including the Pilbara and Kimberley regions, with additional records from the Vasse River estuary, Lake Guraga, Namming Nature Reserve, and Esperance to Albany corridor.	Desktop database searches identified records of the Long-toed Stint in the Desktop Study Area.	One that can support >230 individuals (0.1% of flyway population)	230	Habitat loss Habitat degradation Disturbance Direct mortality
Fork-tailed Swift (*Apus pacificus*)	The Fork-tailed Swift is a highly aerial species, typically flying from less than 1 m to over 300 m above ground, and often much higher. In Australia, they are mostly found over inland plains but also frequent foothills, coastal areas, cliffs, beaches, islands, and even offshore (Higgins, 1999). The species forage exclusively in flight.	The species is a non-breeding summer visitor recorded in all Australian states and territories. It is widespread but scattered, most commonly observed along coastal and sub-coastal regions from the Kimberley and Pilbara through the south-west and across eastern Australia. Inland records occur throughout the Wheatbelt, Pilbara and arid interior.	The species was detected from the PMST database only during the desktop assessment. An ad-hoc review of the Cornell Lab of Ornithology (2025) eBird database has identified a record 30 km southwest of the Project Area in Lancelin from April 2025. The record is considered to have low–moderate reliability.	The global population is still not quantified and there are no measures of abundance in Australia. The largest flocks recorded in Australia were 90 000 near Mildura, Victoria, during 1961 (Simpson, K, 1961).		There are no significant threats to the Fork-tailed Swift in Australia. Potential threats include habitat destruction and predation by feral animals.

** Previous estimates for Ruff in Hansen et al. (2016) did not exclusively reflect numbers within the East Asian Australasian Flyway (EAAF) but included portions of the Central Asian Flyway population. A more recent assessment (Ministry of the Environment Japan, 2021) estimated the flyway population at 500 – 1,000 birds, which has been adopted by Wetlands International (2025) as 'best guess'.*

*** The population of Glossy Ibis within Australia is estimated to be approximately 12% of the species' total population (Marchant & Higgins, 1993). The estimated total population is 1.2 – 3.2 million.*

Table I.2 Migratory Species: Occurrence and Habitat in Project Area

Species	Occurrence in Project Area	Suitable Habitat in Project Area
Red-necked Stint *(Calidris ruficollis)*	Three individuals of the Red-necked Stint were recorded during the Summer 2025 BBUS event at a wetland west of Brand Highway.	Migratory shorebirds are known or considered likely to occur at four wetlands within the Project Area. Three of these wetlands are adjacent to one another in the west of the Project Area and are located 3.5 km from the nearest turbine. The pH of these wetlands was measured on 23 September 2025 with their values ranging 8.38 to 8.74. A pH in the range of 6.5 to 9.0 is considered ideal for freshwater aquatic organisms which the shorebirds may feed on (ANZECC 1992, CCREM 1991, Alabaster & Lloyd 1982, USEPA 1986). The fourth wetland is Lake Yangy found in the eastern part of the Project Area. Due to its smaller size and higher pH of 11.54 (measured on 23 September 2025), it is less likely to attract notable numbers of migratory shorebirds, with any presence also expected to be of shorter duration.
Ruff (*Calidris pugnax*)	Three individuals of the Ruff were recorded during the Summer 2025 BBUS event at a wetland west of Brand Highway.	
Wood Sandpiper (*Tringa glareola*)	A total of 15 Wood Sandpiper were recorded on two separate occasions during the Basic and Targeted Fauna Survey in Spring 2024, at the same wetland West of Brand Highway.	
Common Sandpiper (*Actitis hypoleucos)*	Not recorded during the field survey program.	
Glossy Ibis (*Plegadis falcinellus*)	Not recorded during the field survey program.	
Pacific Golden Plover (*Pluvialis fulva*)	Not recorded during the field survey program.	
Long-toed Stint (*Calidris subminuta*)	Not recorded during the field survey program.	
Fork-tailed Swift (*Apus pacificus*)	Not recorded during the field survey program.	This species is almost exclusively aerial and has seldom been observed roosting on trees or the ground, and are thought to roost aerially. They also forage exclusively in flight (Higgins, 1999). The Fork-tailed Swift is only likely to forage above the Project Area.

Table I.3 Migratory Species Significant Impact Assessment

Criteria	Impact Assessment
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.	Direct impact of migratory species habitat will be restricted to the temporary clearing of 1 ha of wetland habitat, which accounts for 0.36% of the most suitable habitat within the Project Area. The habitat to be temporarily cleared will be restricted to a single wetland and limited to 1 ha of degraded fringeline habitat that is unlikely to contain foraging material. The clearing is required to connect to existing transmission infrastructure and will be rehabilitated following the construction works. Potential for habitat modification will be managed via the implementation of a Project specific: • Construction Environmental Management Plan • Surface Water Management Plan • Bushfire Management Plan The Project is also unlikely to isolate migratory shorebird habitat within the Project Area due to turbines being setback 3.5 km from the more suitable wetlands located west of Brand Highway.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	The Project is not likely to result in the establishment of an invasive species that is harmful to migratory species. The key invasive species that are harmful to migratory species as identified in EPBC Act Policy Statement 3.21 is invasion of intertidal mudflats by weeds such as cord grass. Cordgrass is typically associated with coastal environments, and noting the Project is located 30 km from the coast, establishment of cordgrass is highly unlikely. The potential for the establishment of cord grass, and other invasive species, will be mitigated through the implementation of the CEMP which includes vehicle hygiene measures, weed and pest inspection requirements, clean-down procedures, and controls on imported fill.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	The Project is not likely to seriously disrupt the lifecycle of an ecologically significant proportion of the population of migratory species for the following reasons: • Direct habitat loss will be limited to the temporary clearing of 1 ha of degraded wetland habitat that is unlikely to contain foraging material. • Turbines have been setback 3.5km from the most suitable wetlands in the Project Area to minimise potential for blade strike. • Infrastructure (BESS, substation) has been set back over 175 m from the edge of wetlands that provide the most suitable habitat to support migratory shorebirds. This exceeds the minimum 165 m minimum buffer recommended by (DoEE, 2017) for managing disturbance. • The migratory species do not breed in Australia.

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