Part 4: Attachments

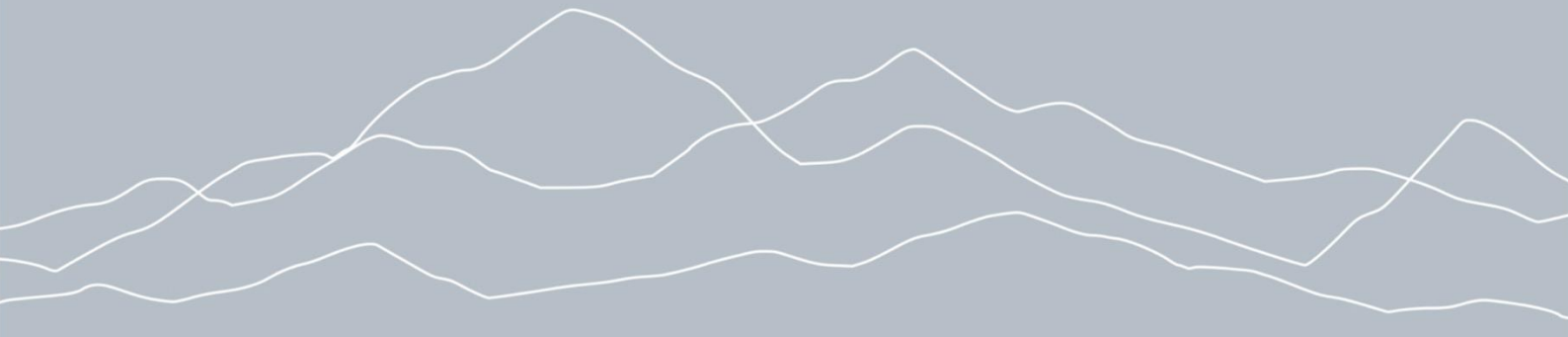
Attachment A: Detailed categorisation and preliminary assessment for protected matters

Attachment B: Background information for the combined fauna assessment: birds

Attachment C: Background information for the combined fauna assessment: fish

NWGGA Strategic Assessment Report

Public re-exhibition version



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A. Detailed categorisation and preliminary assessment for protected matters

This attachment contains the detailed results of the categorisation processes described in Section 18.2 of Chapter 18.

Specifically, this attachment outlines:

- The categorisation and assessment of threatened species, including:
  - The results of Step 2 of the categorisation methodology in which criteria are applied to remove species which will clearly not be impacted from the full list of identified potentially relevant species (see Table 1),
  - The results of Step 3 of the categorisation methodology, which outlines the preliminary assessment of each threatened species which remained after the application of Step 2 (see Table 2)
- The categorisation and preliminary assessment of threatened ecological communities (see Table 3)
- The categorisation and preliminary assessment of FPAL species and communities (see Table 4 and Table 5)
- The categorisation and preliminary assessment of migratory species (see Table 6 and Table 7)

Matters that were considered relevant were assigned to 'Category 1' and assessed in detail in Part 4 of this report. Category 1 matters were those that were considered at risk of direct, indirect, or cumulative impacts due to implementation of the Plan.

Matters that were identified and examined, but determined not to be relevant were assigned to 'Category 2'. These matters are not at risk of direct, indirect, or cumulative impacts due to implementation of the Plan or are not reliant on or present within the Strategic Assessment Area. For these matters, no further assessment is required.

THREATENED SPECIES CATEGORISATION

Table 1: Threatened species categorisation results

Scientific	Common	EPBC Act Listing	Records in the Study Area		Likelihood		Potentially relevant
			VBA	EHP	EHP	PMST	
Flora							
Amphibromus fluitans	Floating Swamp Wallaby-grass	Vulnerable	Yes	No	Low	Known	Yes
Caladenia calcicola	Limestone Spider-orchid	Vulnerable	Yes	No	N/A	N/A	Yes
Caladenia concolor	Crimson Spider-orchid, Maroon Spider-orchid	Vulnerable	No	No	N/A	Known	Yes
Caladenia ornata	Ornate Pink Fingers	Vulnerable	Yes	No	N/A	Known	Yes
Caladenia pumila	Dwarf Spider-orchid	Critically Endangered	Yes	No	Low	Known	Yes
Dianella amoena	Matted Flax-lily	Endangered	Yes	No	Moderate	Known	Yes
Diuris basaltica	Small Golden Moths Orchid	Endangered	Yes	No	Low	May	Yes
Diuris fragrantissima	Sunshine Diuris	Endangered	No	No	N/A	May	No
Dodonaea procumbens	Trailing Hop-bush	Vulnerable	No	No	Low	Likely	Yes
Eucalyptus crenulata	Buxton Gum	Endangered	Yes	No	N/A	N/A	Yes
Euphrasia collina subsp. muelleri	Purple Eyebright	Endangered	Yes	No	Low	N/A	Yes
Glycine latrobeana	Clover Glycine	Vulnerable	Yes	No	Moderate	Known	Yes
Lachnagrostis adamsonii	Adamson's Blown-grass	Endangered	Yes	No	High	Known	Yes
Lepidium aschersonii	Spiny Pepper-cress	Vulnerable	Yes	No	N/A	Likely	Yes
Lepidium hyssopifolium	Basalt Pepper-cress	Endangered	No	No	Moderate	Likely	Yes
Leucochrysum albicans subsp. tricolor	Grassland Paper-daisy	Endangered	Yes	No	Low	Known	Yes
Pimelea spinescens subsp. spinescens	Spiny Rice-flower	Critically Endangered	Yes	No	Moderate	Known	Yes

Scientific	Common	EPBC Act Listing	Records in the Study Area		Likelihood		Potentially relevant
			VBA	EHP	EHP	PMST	
Prasophyllum spicatum	Dense Leek-orchid	Vulnerable	Yes	No	Low	Likely	Yes
Prasophyllum suaveolens	Fragrant Leek-orchid	Critically Endangered	Yes	No	Low	N/A	Yes
Prasophyllum validum	Sturdy Leek-orchid	Vulnerable	No	No	N/A	Likely	Yes
Pterostylis chlorogramma	Green-striped Greenhood	Vulnerable	Yes	No	Low	Known	Yes
Pterostylis cucullata	Leafy Greenhood	Vulnerable	No	No	Low	Known	Yes
Rutidosis leptorrhynchoides	Button Wrinklewort	Endangered	Yes	No	Moderate	Known	Yes
Senecio macrocarpus	Large-fruit Fireweed	Vulnerable	Yes	No	Moderate	Known	Yes
Senecio psilocarpus	Swamp Fireweed	Vulnerable	No	No	Low	Likely	Yes
Swainsona murrayana	Slender Darling-pea, Slender Swainson, Murray Swainson-pea	Vulnerable	No	No	N/A	May	No
Thelymitra epipactoides	Metallic Sun-orchid	Endangered	No	No	Low	May	No
Thelymitra matthewsii	Spiral Sun-orchid	Endangered	No	No	Low	May	No
Thelymitra orientalis	Hoary Sun-orchid	Critically Endangered	No	No	N/A	May	No
Xerochrysum palustre	Swamp Paper Daisy	Vulnerable	Yes	No	Low	Known	Yes
Mammals							
Antechinus minimus maritimus	Swamp Antechinus	Vulnerable	No	No	Unlikely	May	No
Balaenoptera musculus	Blue Whale	Endangered, migratory	No	No	N/A	Likely	Yes
Dasyurus maculatus maculatus	Spot-tailed Quoll	Endangered	No	No	Unlikely	May	No
Eubalaena australis	Southern Right Whale	Endangered, Cetacean, migratory	Yes	No	Unlikely	Known	Yes
Isoodon obesulus obesulus	Southern Brown Bandicoot	Endangered	Yes	No	Unlikely	Likely	Yes
Mirounga leonina	Southern Elephant Seal	Vulnerable	Yes	No	Unlikely	N/A	Yes

Scientific	Common	EPBC Act Listing	Records in the Study Area		Likelihood		Potentially relevant
			VBA	EHP	EHP	PMST	
Perameles gunnii	Eastern Barred Bandicoot (Tasmania)	Vulnerable	Yes	No	Unlikely	Known	Yes
Petaurus australis australis	Yellow-bellied glider	Vulnerable	No	No	N/A	Likely	Yes
Petrogale penicillata	Brush-tailed Rock-wallaby	Vulnerable	Yes	No	N/A	N/A	Yes
Pseudomys novaehollandiae	New Holland Mouse	Vulnerable	No	No	N/A	Likely	Yes
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Yes	No	Low	Known	Yes
Birds							
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Yes	No	Unlikely	Known	Yes
Aphelocephala leucopsis	Southern Whiteface	Vulnerable	Yes	No	N/A	Known	Yes
Ardenna grisea	Sooty Shearwater	Vulnerable	Yes	No	N/A	May	Yes
Arenaria interpres	Ruddy Turnstone	Vulnerable	Yes	No	Unlikely	Known	Yes
Botaurus poiciloptilus	Australasian Bittern	Endangered	Yes	No	Unlikely	Known	Yes
Calidris acuminata	Sharp-tailed Sandpiper	Vulnerable	Yes	No	N/A	Known	Yes
Calidris canutus	Red Knot, Knot	Vulnerable, marine, migratory	Yes	No	Low	Known	Yes
Calidris ferruginea	Curlew Sandpiper	Critically Endangered, marine, migratory	Yes	No	Low	Known	Yes
Calidris tenuirostris	Great Knot	Vulnerable, marine, migratory	Yes	No	Unlikely	Known	Yes
Callocephalon fimbriatum	Gang-Gang Cockatoo	Endangered	Yes	No	N/A	Known	Yes
Charadrius leschenaultii	Greater Sand Plover	Vulnerable, marine, migratory	Yes	No	Unlikely	Known	Yes
Charadrius mongolus	Lesser Sand Plover	Endangered, marine, migratory	Yes	No	Unlikely	Known	Yes
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	Vulnerable	Yes	No	Low	Known	Yes
Diomedea antipodensis	Antipodean Albatross	Vulnerable, marine, migratory	No	No	N/A	Likely	Yes

Scientific	Common	EPBC Act Listing	Records in the Study Area		Likelihood		Potentially relevant
			VBA	EHP	EHP	PMST	
Diomedea epomophora	Southern Royal Albatross	Vulnerable, marine, migratory	No	No	Unlikely	Likely	Yes
Diomedea exulans	Wandering Albatross	Vulnerable, marine, migratory	Yes	No	Unlikely	Likely	Yes
Diomedea sanfordi	Northern Royal Albatross	Endangered, marine, migratory	No	No	Unlikely	Likely	Yes
Falco hypoleucos	Grey Falcon	Vulnerable	No	No	Low	Likely	Yes
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	Vulnerable	Yes	No	Unlikely	Known	Yes
Grantiella picta	Painted Honeyeater	Vulnerable	Yes	No	Unlikely	Known	Yes
Halobaena caerulea	Blue Petrel	Vulnerable	Yes	No	N/A	N/A	Yes
Hirundapus caudacutus	White-throated Needletail	Vulnerable, marine, migratory	Yes	No	Low	Known	Yes
Lathamus discolor	Swift Parrot	Critically Endangered, marine	Yes	No	Low	Known	Yes
Limnodromus semipalmatus	Asian Dowitcher	Vulnerable	Yes	No	N/A	N/A	Yes
Limosa limosa	Black-tailed Godwit	Endangered	Yes	No	Unlikely	Known	Yes
Lophochroa leadbeateri	Major Mitchell's Cockatoo	Endangered	Yes	No	Low	N/A	Yes
Limosa lapponica baueri	Western Alaskan Bar-tailed Godwit	Endangered	Yes	No	Unlikely	Known	Yes
Macronectes giganteus	Southern Giant-Petrel	Endangered, marine, migratory	Yes	No	Unlikely	May	Yes
Macronectes halli	Northern Giant Petrel	Vulnerable, marine, migratory	Yes	No	Unlikely	Likely	Yes
Melanodryas cucullata cucullata	South-eastern Hooded Robin, Hooded Robin (south-eastern)	Endangered	Yes	No	Low	Known	Yes
Neophema chrysogaster	Orange-bellied Parrot	Critically Endangered, Marine	Yes	No	Unlikely	Known	Yes
Neophema chrysostoma	Blue-winged Parrot	Vulnerable	Yes	No	N/A	Known	Yes
Numenius madagascariensis	Eastern Curlew	Critically Endangered, marine, migratory	Yes	No	Unlikely	Known	Yes
Pachyptila turtur subantarctica	Fairy Prion	Vulnerable	Yes	No	Unlikely	Known	Yes

Scientific	Common	EPBC Act Listing	Records in the Study Area		Likelihood		Potentially relevant
			VBA	EHP	EHP	PMST	
Pedionomus torquatus	Plains-wanderer	Critically Endangered	Yes	No	Unlikely	Known	Yes
Phoebetria fusca	Sooty Albatross	Vulnerable, marine, migratory	No	No	Unlikely	Likely	Yes
Pluvialis squatarola	Grey Plover	Vulnerable	Yes	No	Unlikely	Known	Yes
Polytelis swainsonii	Superb Parrot	Vulnerable	Yes	No	N/A	N/A	Yes
Pterodroma leucoptera leucoptera	Gould's Petrel	Endangered	No	No	Unlikely	May	No
Rostratula australis	Australian Painted Snipe	Endangered, marine	Yes	No	Low	Known	Yes
Stagonopleura guttata	Diamond Firetail	Vulnerable	Yes	No	Low	Known	Yes
Sternula nereis nereis	Australian Fairy Tern	Vulnerable	Yes	No	Unlikely	Known	Yes
Thalassarche bulleri	Buller's Albatross	Vulnerable, marine, migratory	No	No	Unlikely	May	No
Thalassarche bulleri platei	Northern Buller's Albatross	Vulnerable, marine	No	No	Unlikely	May	No
Thalassarche carteri	Indian Yellow-nosed Albatross	Vulnerable, marine, migratory	Yes	No	Unlikely	Likely	Yes
Thalassarche cauta	Shy Albatross	Endangered, marine, migratory	Yes	No	Unlikely	Likely	Yes
Thalassarche chrysostoma	Grey-headed Albatross	Endangered, marine, migratory	No	No	Unlikely	May	No
Thalassarche impavida	Campbell Albatross	Vulnerable, marine, migratory	No	No	N/A	Likely	Yes
Thalassarche melanophris	Black-browed Albatross	Vulnerable, marine, migratory	Yes	No	Unlikely	Likely	Yes
Thalassarche salvini	Salvin's Albatross	Vulnerable, marine, migratory	No	No	Unlikely	Likely	Yes
Thalassarche steadi	White-capped Albatross	Vulnerable, marine, migratory	No	No	N/A	Known	Yes
Thinornis cucullatus cucullatus	Eastern Hooded Plover	Vulnerable, Marine	Yes	No	N/A	Known	Yes
Tringa nebularia	Common Greenshank	Endangered	Yes	No	Unlikely	Known	Yes
Xenus cinereus	Terek Sandpiper	Vulnerable	Yes	No	Unlikely	Known	Yes
Reptiles							
Aprasia parapulchella	Pink-tailed Worm-lizard	Vulnerable	No	No	Unlikely	May	No

Scientific	Common	EPBC Act Listing	Records in the Study Area		Likelihood		Potentially relevant
			VBA	EHP	EHP	PMST	
Caretta caretta	Loggerhead Turtle	Endangered, marine, migratory	No	No	Unlikely	Known	Yes
Chelonia mydas	Green Turtle	Vulnerable, marine, migratory	No	No	Unlikely	May	No
Delma impar	Striped Legless Lizard	Vulnerable	Yes	Yes	High	Known	Yes
Dermochelys coriacea	Leatherback Turtle	Endangered, marine, migratory	Yes	No	Unlikely	Known	Yes
Lepidochelys olivacea	Pacific (Olive) Ridley	Endangered	Yes	No	N/A	N/A	Yes
Lissolepis coventryi	Swamp Skink, Eastern Mourning Skink	Endangered	No	No	Unlikely	May	No
Tympanocryptis pinguicolla	Victorian Grassland Earless Dragon	Critically Endangered	Yes	No*	Unlikely	Known	Yes
Amphibians							
Litoria raniformis	Growling Grass Frog	Vulnerable	Yes	Yes	High	Known	Yes
Fish							
Carcharodon carcharias	Great White Shark	Vulnerable, migratory	No	No	N/A	Known	Yes
Maccullochella peelii	Murray Cod	Vulnerable	Yes	No	Unlikely	N/A	Yes
Macquaria australasica	Macquarie Perch	Endangered	Yes	No	Low	N/A	Yes
Nannoperca obscura	Yarra Pygmy Perch	Endangered	Yes	No	Low	Known	Yes
Prototroctes maraena	Australian Grayling	Vulnerable	Yes	No	Moderate	Known	Yes
Insects							
Synemon plana	Golden Sun Moth	Critically Endangered	Yes	Yes	High	Known	Yes

* While EHP did not conduct surveys for VGED as it was presumed extinct, targeted surveys by Biosis in 2024 did not record the species in the Growth Areas (Biosis, 2024).

Table 2: Preliminary assessment for threatened species

Scientific name	Common name	Listing status	Category	Justification
Flora				
Amphibromus fluitans	Floating Swamp Wallaby-grass	Vulnerable	2	*Amphibromus fluitans* (River Swamp Wallaby-grass) is an aquatic or semi-aquatic perennial plant that may inhabit man-made or natural water bodies such as lagoons, swamps, billabongs, and dams (DEWHA, 2008a). The species grows permanent waterbodies with seasonally fluctuating water levels (TSSC, 2012) The species is known from South Australia, southern NSW, Victoria, Tasmania and New Zealand. Numerous populations occur in northern Victoria near the Murray River and its tributaries. It is also known from several localities in Gippsland (including Rosedale, Meeniyan, and Wonthaggi) Melbourne, Ballarat, and the Portland-Casterton areas (DEWHA, 2008a). Insufficient data is available on population locations and trends, although the species is known from numerous populations in northern Victoria and from several localities in southern Victoria (DCCEEW, 2022b). The species is threatened by changes to hydrology, particularly the draining of swamps and conversion of wetlands to dams, weed invasion and grazing by stock (DEWHA, 2008a). There are four records of the species within the Study Area, all associated with Little River approximately 18.5 km to the north. There are no records of the species within the Strategic Assessment Area. The species is unlikely to be directly impacted by the Plan. The absence of species records within or near the Strategic Assessment Area suggest the species is unlikely to be present. Further, the species occurs in association with permanent waterbodies. No such areas will be developed under the Plan. The species is also unlikely to be impacted indirectly as a result of development within the Growth Areas for the following reasons: • The records within the Study Area are in a different catchment to the Growth Areas and there are no known records downstream of development • Other potential indirect impacts from development, such as those associated with weeds or human disturbance, are unlikely to exacerbate existing threats to the species given the agricultural landscape context and the distance of the nearest records to proposed development

Scientific name	Common name	Listing status	Category	Justification
Caladenia calcicola	Limestone Spider-orchid	Vulnerable	2	*Caladenia calcicola* (Limestone Spider-orchid) is a small terrestrial orchid with mostly red flowers. As of 2012, Limestone Spider-orchid was known from eight subpopulations, with a total of 277 recorded individuals. The species predominantly occurs near Nelson and Portland in Victoria. Across parts of its range, Limestone Spider-orchid occurs in Limestone Woodland and Grassy Woodland/Hills. It also occurs in Grassy Woodland/Hills Herb-rich Woodland/Damp Sands Herb-rich Woodland (Dickson *et al.*, 2012). Threats to the species include vegetation clearance, isolation and limited genetic exchange, grazing, weed invasion, and disturbance from recreational activity (Dickson *et al.*, 2012). There is one record of the species within the Study Area, located at Inverleigh Flora reserve approximately 20 km west of the Growth Areas. There are no records of the species within the Strategic Assessment Area. The species is unlikely to be directly impacted by the Plan. The absence of species records within or near the Strategic Assessment Area suggest the species is unlikely to be present. Further, The environmental features of the Strategic Assessment Area (which primarily consists of grasslands) are generally not suitable for this species (which occurs in woodlands). Direct impacts are therefore considered unlikely. Potential indirect impacts of development, such as those associated with weeds and habitat disturbance, are unlikely to exacerbate threats to the species given that there is minimal woodland areas in close proximity to the Growth Areas, and the distance of the nearest records to proposed development.
Caladenia concolor	Crimson Spider-orchid, Maroon Spider-orchid	Vulnerable	2	*Caladenia concolor (*Crimson Spider Orchid) is a small orchid (15 – 25 cm tall) with purple – red flowers. The species occurs in Victoria, and limited locations in NSW. In Victoria, it occurs in the following bioregions: Victorian Volcanic Plain, Victorian Riverina Goldfields, Central Victoria Uplands, Northern Inland Slopes, Southern and Northern Highlands and Victorian alps Bioregions. The species occurs in dry eucalypt forest, heathland, closed scrub and grassland. Flowering occurs from August to late October (TSSC, 2016c). Threats to the Crimson Spider Orchid include invasive weeds, grazing by stock and rabbits, land clearing, rubbish dumping, and too frequent fire (TSSC, 2016c). It is noted that the draft NSW Recovery Plan identifies the main disturbance of concern at the time to be dense growth of exotic annual grass species (NSW NPWS, 2003). There are no VBA records of the species within the Study Area. However, there are four records of the species within the Study Area listed on the Atlas of living Australia. These records are isolated, and include (ALA, 2025):

Scientific name	Common name	Listing status	Category	Justification
				• One record at Bannockburn dated 2005, approximately 11 km to the west of the Growth Areas • One record east of Anakie dated 2012. This record is approximately 8 km north of the NGGA • Two records in Brisbane Ranges National Park, dated 2015 and 2020. These records are approximately 18.5 km north-west of the Growth Areas It is considered unlikely that this species would be present within the Strategic Assessment Area, as the Strategic Assessment Area is outside of the known distribution of the species within Victoria and the species has not been recorded in close proximity. In addition, the Strategic Assessment Area is unlikely to provide suitable habitat given the agricultural context of the landscape, and invasion of exotic grasses. Direct impacts are therefore considered unlikely. Potential indirect impacts from development, such as those associated with weed invasion and rubbish dumping are unlikely to exacerbate threats to the species. Two of the existing records are located within an urban and agricultural landscape subject to existing threats. The remaining two records are located within a National Park managed for conservation.
Caladenia ornata	Ornate Pink Fingers	Vulnerable	2	*Caladenia ornata* (Ornate Pink Fingers) is a plant that occurs in woodlands, heathy woodlands, heathlands and seasonally in moist sand and clay loams. The species occurs in South Australia and Victoria. As of 2008, it was known from 19 populations containing approximately 500 individuals (DEWHA, 2008b). The species is threatened by weed invasion, habitat disturbance, trampling and grazing by feral rabbits and macropods, along with extinction due to limited habitat, low plant numbers, and inappropriate fire regimes (DEWHA, 2008b). There are no records of the species within or near the Strategic Assessment Area. The environmental features of the Strategic Assessment Area (which primarily consists of grasslands on heavy clay soils) are generally not suitable for this species (which occurs in woodlands and heathlands on lighter soils). Direct impacts are therefore considered unlikely. One record occurs within the Study Area (observed 1996) approximately 17.5 km from the Growth Areas. The potential indirect impacts of development, such as those associated with weeds, habitat disturbance and fire, are unlikely to exacerbate threats to the species given the species is located in an existing protected area managed for conservation purposes (Brisbane Ranges National Park) and the distance of the nearest records to proposed development.

Scientific name	Common name	Listing status	Category	Justification
Caladenia pumila	Dwarf Spider-orchid	Critically Endangered	2	*Caladenia pumila* (Dwarf Spider Orchid) is an orchid occurring within the Victorian Volcanic Plains Bioregion. The species was previously known from one location at Bannockburn in Victoria with records observed in 1926. The Dwarf Spider Orchid was considered extinct until it was rediscovered in Inverleigh Nature Reserve near Bannockburn in 2009. As of 2013, there were two known plants at this site, and the species AOO was estimated to be ~1 km (DoE, 2013a). More recent records (up to 2018) are available for the species, all of which are at Inverleigh Nature Reserve on the VBA database. There is limited understanding of the species ecology and habitat requirements. The species is threatened by habitat degradation, trampling by people, browsing, illegal collection, a lack of genetic diversity and competition with native species (DoE, 2013a). There are 12 records of the species within the Study Area. Two records (both dated 1926) are approximately 9.5 km from the Growth Areas in a developed agricultural area and are unlikely to be extant in this location today. The remaining 10 records are dated 2009-2018 in Inverleigh Nature Reserve, approximately 20 km from the Growth Areas. There are no records of the species within or near the Strategic Assessment Area. The species is thought to be sensitive to habitat degradation. It is noted that most of the Strategic Assessment Area is highly modified due to historical and current farming practices and development. Given the absence of records within the Strategic Assessment Area, and the distance of the Strategic Assessment Area from known occurrences of the species, and the level of disturbance within the Strategic Assessment Area, it is considered unlikely that the species is present within the Strategic Assessment Area. Subsequently, direct impacts are considered unlikely. Potential indirect impacts from development, such as those associated with habitat degradation, trampling by people or illegal collection are unlikely to exacerbate existing threats to the species given the population is within an existing protected area managed for conservation purposes, and the distance of the nearest records to proposed development.
Dianella amoena	Matted Flax-lily	Endangered	2	*Dianella amoena* (Matted Flax-lily) a small, tufted lily that has a wide distribution from eastern to south-western Victoria (Carter, 2010a). The species grows in grassland and grassy woodland habitats, on well drained to seasonally wet sandy loams to heavy clay soils. Sites may lack a tree canopy and contain a high cover of non-native species. The surrounding location of most sites has been severely altered post-European settlement (Carter, 2010a).

Scientific name	Common name	Listing status	Category	Justification
				As of 2010, there were thought to be around 2,500 remaining plants in total. Populations are small and highly fragmented. The species is threatened by habitat destruction or disturbance, weed invasion and population fragmentation (Carter, 2010a). Targeted surveys were undertaken for the Matted Flax-lily within the Growth Areas. No individuals of the species were identified. Further, habitat within the surveyed areas was considered marginal, and it was considered highly unlikely that the species would occur within the surveyed areas of the Growth Areas (EHP, 2021). The unsurveyed areas of the Growth Areas are assumed to support habitat for the same threatened species which were recorded within the Growth Areas (see Section 13.3.2 of Part 3 for details). Given that these areas are more modified or degraded than the surveyed areas of the Growth Areas, and the species was not recorded during targeted surveys, potential direct impacts to Matted Flax-Lily within the unsurveyed areas are unlikely. The broader Strategic Assessment Area has not been surveyed and will be subject to development within the external infrastructure footprints. The Plan includes a Measure to undertake targeted surveys within the external infrastructure footprints for all protected matters with the potential to occur. Any potential direct impacts to the species within these areas will be addressed following field surveys. There are 25 records within the Study Area, the closest of which is a cluster of records occurring 8.9 km from the Growth Areas at Little River. The potential indirect impacts of development, such as those associated with weeds and habitat disturbance, are unlikely to exacerbate threats to the species given the agricultural landscape context and the distance of the nearest records to proposed development.
Diuris basaltica	Small Golden Moths Orchid	Endangered	2	*Diuris basaltica* (Small Golden Moths Orchid) is a small orchid that inhabits herb-rich native grasslands dominated by Kangaroo Grass. Habitat is dominated by tussock-forming perennial grasses, with wildflowers and herbs dispersed throughout (Backhouse and Lester, 2010). Small Golden Moths Orchid is endemic to an area of 50 km from Sydenham to Lara in Victoria in the Victorian Volcanic Plains bioregion (Backhouse and Lester, 2010). The Strategic Assessment Area is to the west of this area. The species was considered extinct in the late 1990s, although subsequent surveys re-discovered small populations. The species is currently known from only three locations near Melbourne at Laverton, Derrimut and Rockbank (Backhouse and Lester, 2010).

Scientific name	Common name	Listing status	Category	Justification
				Habitat loss is the major cause of decline. The species is also threatened by disturbance, grazing and predation, weed invasion, and altered fire regimes (Backhouse and Lester, 2010). There is a 1998 record of the species to the east of the Strategic Assessment Area, within the North Shore locality adjacent to Rollerama Drain. This site is in a heavily developed environment and is approximately 4 km from the nearest Growth Area. It is unlikely that this population is extant as the site, given the age of the record, the developed and disturbed characteristics of the site, and that the location was not recognised in the species' Recovery Plan (Backhouse and Lester, 2010). There are no records of the species within or near the Strategic Assessment Area. The species is thought to be sensitive to habitat degradation. It is noted that most of the Strategic Assessment Area is highly modified due to historical and current farming practices and development. Given the level of disturbance within the Strategic Assessment Area, it is considered unlikely that the species is present within the Strategic Assessment Area. Overall, direct impacts are considered unlikely. There are otherwise no records of the species within the broader Study Area. Suitable potential habitat is limited within a largely agricultural landscape. Potential indirect impacts to the species are therefore considered unlikely.
Dodonaea procumbens	Trailing Hop-bush	Vulnerable	2	*Dodonaea procumbens* (Trailing Hop-bush), is a small prostrate shrub which occupies low lying woodlands, and low open forests, heathland and grasslands. The species may occur on disturbed and exposed sites including road verges and cuttings, along with rocky outcrops (Carter, 2010c). Trailing Hop-bush is distributed across south-eastern Australia, in Victoria, New South Wales and South Australia. In Victoria, the species mainly occurs in in the western half of the state. The Geelong region is not identified as a site of known occurrence of the species within the species' Recovery Plan (Carter, 2010c). As of 2010, there were thought to be about 50 remaining populations, most of which were small. The species is threatened by disturbance/destruction, weed invasion, grazing, and altered fire regimes (Carter, 2010c). There are also no existing records within the Strategic Assessment Area or the broader Study Area. Suitable potential habitat is limited within a largely agricultural landscape. Given the lack of records and limited potential habitat, it is considered unlikely that the

Scientific name	Common name	Listing status	Category	Justification
				species occurs within the Study Area. Therefore, direct and indirect impacts to the species are considered unlikely.
Eucalyptus crenulata	Buxton Gum	Endangered	2	*Eucalyptus crenulata* (Buxton Gum) is a small tree endemic to south central Victoria. The species is likely to have been naturally rare with a highly restricted distribution prior to European settlement. The species is cold-adapted and was likely more widespread in colder periods in the past climate of southern Australia (White, Murphy and Downe, 2006; TSSC, 2016e). In its natural range, it is currently rare in both abundance and distribution, occupying a total of less than 10 ha across two populations with less than 700 plants. The two wild populations are located 64 km apart at Buxton and Yering and are separated by the Great Dividing Range (TSSC, 2016e). The Study Area is outside of the natural range of the species. The species is an attractive tree which is commonly grown as an ornamental across south-eastern Australia and is naturalised at a number of locations outside its natural range. There are far more individuals in cultivation than in the wild (TSSC, 2016e). The Buxton population occurs in open forest dominated by *Eucalyptus ovata* on a poorly drained hollow. The Yering population occurs in a partially cleared, and significantly altered floodplain in low lying wet/swampy habitats. The species is threatened by habitat loss and disturbance, invasive species, trampling and soil compaction from cattle grazing, infection with *Phytophthora cinnamomi,* and inappropriate fire regimes (TSSC, 2016e). There are two records within the Study Area, the closest occurring 12.7 km west of the Growth Areas. These records are not in the vicinity of either Buxton or Yering (which occur to the east of Melbourne). These records are likely to be either cultivated or naturalised individuals outside of the species' natural range. The species has not been recorded within the Strategic Assessment Area. Mapping of pre-1750 vegetation communities (DELWP, 2022a) indicates that the Strategic Assessment Area is predicted to be comprised almost entirely of grassland communities. It is considered unlikely that this species would naturally occur within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. Potential indirect impacts to natural populations of the species are also considered unlikely as the Study Area is outside of the natural range of the species.
Euphrasia collina subsp. muelleri	Purple Eyebright	Endangered	2	*Euphrasia collina subsp. muelleri* (Purple Eyebright) is a perennial herb which inhabits open grassland, grassy woodland, heath in perched swamps, and heathy woodland (TSSC, 2016f).

Scientific name	Common name	Listing status	Category	Justification
				Purple Eyebright was historically widespread across south-eastern Australia, from northern NSW through Victoria to SA. The species has become extinct throughout a substantial proportion of its range (TSSC, 2016f). In 2006, the species was known to occur at 11 widely separated localities in Victoria. Of these 11 localities, 3 were considered possibly destroyed or extinct. Of the 8 extant populations, 3 had uncertain taxonomy (TSSC, 2016f). None of these locations are in the vicinity of the Study Area. Further, the species' Recovery Plan maps the former and current distribution of the species (Murphy and Downe, 2006). The Study Area is not in proximity to identified current locations of the species. There are estimated to be fewer than 1,500 pants, of which 1,300 occur in one population (Deep Lead) (TSSC, 2016f). The species is threatened by altered fire regimes, habitat clearing, habitat disturbance and modification, weed invasion, and grazing by stock and rabbits (TSSC, 2016f). There are two records of the species within the Study Area (observed in 1770, and 1853), occurring approximately 8.6 km away from the Growth Areas. Given the age of these records and that this locality is not recognised as a current location of the species by either the Recovery Plan or the Conservation Advice, it is unlikely that this population is extant (Murphy and Downe, 2006; TSSC, 2016f). There are otherwise no existing records within the broader Study Area. Suitable potential habitat is limited within a largely agricultural landscape. It is therefore considered unlikely that the species would occur within the Strategic Assessment Area or the wider Study Area. Potential direct and indirect impacts to the species are considered unlikely.
Glycine latrobeana	Clover Glycine	Vulnerable	2	*Glycine latrobeana* (Clover Glycine) is a herb which inhabits grassland and grassy woodland habitat, and occasionally dry forests and heathlands. It occurs from sea level to 1,200 m altitude and is usually found on clay soils but can occur on a range of soil types (Carter and Sutter, 2010). It is endemic to south-eastern Australia. The species has a wide distribution from Port Pirie, through most of Victoria, to Tasmania and SA. In Victoria, the species occurs in the Naracoorte Coastal Plain, the Australian Alps, the Southeastern Highlands, the South East Coastal Plain, Victorian Midlands, and the Victorian Volcanic Plains bioregion. There are about 140 populations, of which 65 occur in Victoria (Carter and Sutter, 2010b). The species is hard to locate and is generally only detected in fruit or flower (DCCEEW, 2022a).

Scientific name	Common name	Listing status	Category	Justification
				Clover Glycine is threatened by weed invasion, inappropriate fire regimes, grazing by native and introduced herbivores, and human-induced disturbance (Carter and Sutter, 2010). Targeted surveys for Clover Glycine were conducted within the Growth Areas. No specimens were identified during survey. Given the presence of known threatening processes within the Growth Areas, it is considered highly unlikely that this species would occur within the surveyed areas of the Growth Areas (EHP, 2021). Direct impacts to the species in these areas are considered unlikely. The unsurveyed areas of the Growth Areas are assumed to support habitat for the same threatened species which were recorded within the Growth Areas (see Section 13.3.2 of Part 3 for details). Given that these areas are more modified or degraded than the surveyed areas of the Growth Areas, and the species was not recorded during targeted surveys, potential direct impacts to Clover Glycine within the unsurveyed areas are unlikely. The broader Strategic Assessment Area has not been surveyed and will be subject to development within the external infrastructure footprints. The Plan includes a Measure to undertake targeted surveys within the external infrastructure footprints for all protected matters with the potential to occur. Any potential direct impacts to the species within these areas will be addressed following field surveys. There are twelve records of the species within the Study Area, two of which pre-date 1900. The remaining eight records date between 2001 and 2017. The closest recent record occurs approximately 13.7 km away from the Growth Areas. Potential indirect impacts from development, such as those associated with weeds and disturbance, are unlikely to exacerbate existing threats to the species given the agricultural landscape context and the distance of the nearest records to proposed development.
Lachnagrostis adamsonii	Adamson's Blown-grass	Endangered	1	*Lachnagrostis adamsonii* (Adamson's Blown-grass) is a grass which is confined to slow moving creeks, depressions and drainage lines which may become waterlogged or inundated seasonally (Murphy, 2010). The species is endemic to south-western Victoria. It occurs in an area of 15,000 km² from Clifton Springs to near Coleraine in the Victorian Volcanic Plains and Victorian Midlands bioregions. It is highly likely that many historical populations of the species were lost due to extensive native vegetation loss within this area (Murphy, 2010). In the 1990s, extensive surveying identified the species at 68 locations. However, the current number of populations is believed to be substantially fewer. The total number of plants is

Scientific name	Common name	Listing status	Category	Justification
				unknown. Estimates suggest there are <50,000 plants. Populations occupy small areas of less than 1 ha (Murphy, 2010). The species' Recovery Plan has identified the following threats: alterations to hydrology, invasion and competition from weeds, disturbance and destruction of plants and habitat, and grazing (Murphy, 2010). The species' 2010 Recovery Plan identified 16 important populations of the species. One important population occurs within the Strategic Assessment Area located at Warners Road near Cowies Creek. This population consists of up to 500 plants and is considered to be the largest population at the eastern edge of the species range (Murphy, 2010). Site surveys in 2019 and 2020 within WGGA did not record Adamson's Blown-grass along Cowies Creek. However, the species has been assumed present in Cowies Creek based on the presence of historical records and suitable habitat (EHP, 2021). Further detailed assessment is needed to understand the potential for direct, indirect and cumulative impacts. Refer to Section 20.1 of Part 4 for the detailed impact assessment of Adamson's Blown-grass.
Lepidium aschersonii	Spiny Pepper-cress	Vulnerable	2	*Lepidium aschersonii* (Spiny Pepper-cress) is a perennial herb that inhabits periodically wet sites including depressions and the margins of marshes and shallow lakes. The species is endemic to mainland Australia and is distributed patchily from NSW to Western Australia (Carter, 2010b). As of 2010, there were 18 known sites in Victoria from 2 geographically separate locations. Almost all sites occur 100 – 200 km west of Melbourne in the area bordered by Mortlake, Cressy, Colac and Ararat, with an outlier near Benambra (Carter, 2010b). Threats to the species include weed invasion, grazing by domestic stock, altered hydrology, habitat destruction, and roadworks (Carter, 2010b). The species has not been recorded within the Growth Areas, and the Growth Areas are unlikely to provide suitable wetland habitat for the species. Modelling of wetland occurrence by DELWP (DELWP, 2022c) has identified two wetland areas in the NGGA. The first of these corresponds to a wastewater treatment plant adjacent to Anakie Road. The second of these appears to be related to two small farm dams (from aerial observations) located in the NGGA Conservation Area. This area was mapped as Plains Grassland (EVC 132) by (EHP, 2021). Overall, direct impacts are considered unlikely. There are seven records of the species within the Study Area. Of these, three occur within the Barwon River catchment downstream of the Growth Areas, while the remaining four

Scientific name	Common name	Listing status	Category	Justification
				occur within the Thompson Creek catchment (which is not hydrologically linked to the Growth Areas). Of the three records within the Barwon River catchment, two occur on the western edge of the Lake Connewarre complex (located in the Lake Connewarre Wildlife Reserve). The remaining record occurs approximately 9.4 km downstream from the Growth Areas, along the Barwon River in the locality of Marshall. This record has an accuracy of 10 km and is more likely to be associated with the records from the Lake Connewarre Complex. The four records within the Thompson Creek catchment are within or adjacent to the Breamlea Flora and Fauna Reserve. The records which occur within the Lake Connewarre Wildlife Reserve and the Breamlea Flora and Fauna Reserve may comprise important populations of the species, as the records occur within protected areas and therefore have a greater potential for long-term viability and recovery. Potential indirect impacts to the records within the Lake Connewarre Complex associated with altered hydrology are considered unlikely. The records occur in an off stream wetland within the Lake Connewarre complex which is unlikely to receive regular flows directly from the Barwon River. As a result, any potential indirect impacts via downstream pathways would be very diffuse or negligible.
Lepidium hyssopifolium	Basalt Pepper-cress	Endangered	2	*Lepidium hyssopifolium* (Basalt Pepper-cress) is a perennial herb which now occurs primarily in heavily modified environments among exotic pasture and weed species. Known sites occur on roadsides or the fringes of agricultural land. Original habitat is unknown, though was likely eucalypt or *Allocasuarina* woodland characterised by a grassy understory and native temperate grasslands (Tumino, 2010). It is endemic to south-eastern Australia. The species has a patchy distribution from south-east NSW, Victoria, and Tasmania. In Victoria, the species occurs west of Melbourne in the Victorian Volcanic Plains and Victorian Midlands bioregions. As of 2010, there were seven populations of the species within Victoria, containing ~500 plants (Tumino, 2010). Microsite conditions are likely to be important for the persistence of the species. Some level of disturbance may be important for seed germination. Seedling survival then relies on the availability of open spaces with reduced competition from other plants, rather than areas with thick groundcover (Tumino, 2010). Threats to the species include competition and invasion from weeds, grazing and trampling, loss of overstory trees, habitat disturbance or destruction, and erosion (Tumino, 2010).

Scientific name	Common name	Listing status	Category	Justification
				There are no existing records of this species within the Strategic Assessment Area or the broader Study Area. Surveys within the Growth Areas concluded that potential habitat for the Basalt Peppercress was poor or limited (EHP, 2021). This is likely due to the existing level of disturbance and threatening processes associated with agricultural practices and development in these areas. It is noted that similar disturbance regimes occur within the Strategic Assessment Area outside of the surveyed areas, alongside the surveyed areas, and so this assessment is also considered applicable to these areas. Given the absence of records for the species within the Study Area and the presence of existing threatening processes, it is considered unlikely that the species would be present within the Strategic Assessment Area. Subsequently, direct impacts are considered unlikely. Potential indirect impacts to the species due to development (such as weed invasion and habitat disturbance) are considered unlikely, given the absence of records and the agricultural landscape context where such threats are pre-existing.
Leucochrysum albicans subsp. tricolor	Hoary Sunray	Endangered	2	*Leucochrysum albicans susp. tricolor* (Hoary Sunray) is a perennial everlasting daisy which inhabits grassland, woodland and forest habitats. All known Victorian occurrences are in grassland or grassy woodlands, often in the spaces between grass tussocks (DAWE, 2021b). The species is endemic to south-eastern Australia. It occurs in three geographically separate areas, NSW/ACT, Victoria, and Tasmania. In Victoria, the species occurs in the Victorian Volcanic Plains bioregion between Colac in the south, Inverleigh in the east, Ballarat and Ararat in the north, and Hamilton in the west (DAWE, 2021b). The Strategic Assessment Area is outside of the known distribution of the species in Victoria (note that Inverleigh, the easternmost known occurrence of the species in Victoria, occurs approximately 20 km west of the Strategic Assessment Area). Threats to the species may include habitat loss and destruction, weed invasion, poor reservation status, lack of appropriate biomass, inappropriate fire regimes, grazing by livestock, climate change (specifically drought) and small population sizes (DAWE, 2021b). There are 15 records of the species within the Study Area, ranging in date from 1853 to 2014. The 1853 record is the closest record to the development (occurring 9.5 km away from the Growth Areas) has no contemporary records nearby. It is not clear if this population is extant. The remaining records are clustered approximately 18.1 km from the Growth Areas, in the vicinity of Inverleigh.

Scientific name	Common name	Listing status	Category	Justification
				It is considered unlikely that this species would be present within the Strategic Assessment Area, as the Strategic Assessment Area is outside of the known distribution of the species within Victoria. Direct impacts are therefore considered unlikely. Potential indirect impacts from development, such as those associated with weed invasion, are unlikely to exacerbate existing threats to the species given the urban and agricultural landscape context of the records and the distance of the nearest records to proposed development.
Pimelea spinescens subsp. spinescens	Spiny Rice-flower	Critically Endangered	1	*Pimelea spinescens subsp. spinescens* (Spiny Rice-flower) is a small spreading shrub which inhabits grasslands including native temperate grasslands, grassy woodlands and open shrublands. Populations may occur in degraded and disturbed patches of habitat (DCCEEW, 2024n). The Spiny Rice-flower is endemic to Victoria. It occurs predominantly in the Victorian Volcanic Plain, with a small number of populations occurring in the Victorian Midlands and Riverina IBRA Bioregions (TSSC, 2016h). The Growth Areas are towards the south-eastern extent of the species distribution. Populations are now substantially fragmented, though retain good genetic diversity. Populations are mostly comprised of less than 500 individuals, although there are populations of over 1,000 individuals. As of 2021, the population size was estimated to be between 70,000 – 90,000 plants. The most recent survey indicates that there are 325 known populations (DCCEEW, 2024n) The species' Conservation Advice (TSSC, 2016h), Recovery Plan (DCCEEW, 2024n) and Significant Impact Guidelines (DEWHA, 2009b) have identified the following threats: habitat loss and fragmentation, inappropriate fire regimes, weed invasion, grazing by feral herbivores and livestock, climate change, land management on private land or public land not designated for conservation, and small and declining populations with limited gene flow. Targeted surveys were undertaken within both Growth Areas for the Spiny Rice-flower. No individuals of the species were identified during these surveys (EHP, 2021). Further, assessment of habitat condition within the surveyed areas of the Growth Areas indicated that there is a low likelihood that the surveyed areas of the Growth Areas would support a population of the Spiny Rice-flower. This is due to the level of disturbance at surveyed sites and existing threats such as weed invasion and lack of suitable habitat

Scientific name	Common name	Listing status	Category	Justification
				features such as inter-tussock spaces (EHP, 2021). It is noted that the species is recognised to be most likely to occur in areas with low levels of disturbance (SWIFFT, 2022e). The unsurveyed areas of the Growth Areas are assumed to support habitat for the same threatened species which were recorded within the Growth Areas (see Section 13.3.2 of Part 3 for details). Given that these areas are more modified or degraded than the surveyed areas of the Growth Areas, and the species was not recorded during targeted surveys, potential direct impacts to Spiny Rice-flower within the unsurveyed areas are unlikely. The broader Strategic Assessment Area has not been surveyed and will be subject to development within the external infrastructure footprints. The Plan includes a Measure to undertake targeted surveys within the external infrastructure footprints for all protected matters with the potential to occur. Any potential direct impacts to the species within these areas will be addressed following field surveys. There are 648 records of the species within the Study Area, with the closest approximately 1 km from the NGGA. Remaining records occur in three broad areas, including: approximately 12 km west of the Growth Areas near Bannockburn, between Lara and the north-eastern boundary of the Study Area, and at Lake Borrie Spit, over 18 km east of the NGGA. Potential indirect impacts to the species as a result of development may be possible, given the proximity of records to the Growth Areas and the density of records in the Study Area (representing 14.4 per cent of records in Victoria). Further detailed assessment is required to understand potential impacts. Refer to Section 20.2 of Part 4 for the detailed impact assessment of the Spiny Rice-flower.
Prasophyllum spicatum	Dense Leek-orchid	Vulnerable	2	*Prasophyllum spicatum* (Dense Leek-orchid) is a perennial, terrestrial orchid which inhabits coastal and near-coastal heathland and heathy woodland. The species is endemic to south-eastern Australia. It is distributed from Gippsland in Victoria to south-east SA. There is a wide disjunction between south Gippsland and south-west Victorian populations. It is currently known from eight populations with 80 plants, although this may underestimate the actual number of plants. None of the currently known populations are in the vicinity of Geelong. Threats include habitat disturbance, grazing by native and/or introduced predators, and altered fire regimes. It is likely that conditions for pollinator and fungal activity have been adversely affected at most sites (M. Duncan, 2010a). The Strategic Assessment Area is not a coastal or near-coastal environment and does not support heathland or heathy woodland. It is considered unlikely that the species would be present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely.

Scientific name	Common name	Listing status	Category	Justification
				There are six clustered records of the species within the Study Area (observed between 1925 – 1934), the closest of which occurs 14.6 km away from the Growth Areas. Given the age of the records and that no contemporary populations of the species are known to occur in the vicinity of Geelong (M. Duncan, 2010a), it is unlikely that this population is extant. There are otherwise no existing records within the broader Study Area. Suitable potential habitat is limited within a largely agricultural landscape. Potential indirect impacts to the species are also considered unlikely.
Prasophyllum suaveolens	Fragrant Leek-orchid	Critically Endangered	2	*Prasophyllum suaveolens* (Fragrant Leek-orchid) is an orchid which inhabits grasslands, and open grassy woodland. The habitat is usually dominated by tussock-forming perennial grasses, along with wildflowers and herbs. The species is endemic to the basalt plains of south-western Victoria. Historically the species was widespread across the basalt plains, and was recorded from Werribee, St Albans, Albion, Laverton, Lara, Tottenham and Merri Creek, and from near Creswick. As of 2010, eight populations were known, containing an estimated 1,500 plants. Threats to the species include weed invasion, habitat disturbance, fire and grazing by rabbits and stock (TSSC, 2016j). There is one record of the species within the Study Area (dated 1924) which occurs within Lara approximately 5.6 km east of the Growth Areas. This record occurs in a developed area and is unlikely to be extant. There are no records of the species within the Strategic Assessment Area. Site surveys completed within the Growth Areas indicated that there is poor or limited habitat for the species (EHP, 2021). These results combined with the lack of records and existing threatening processes suggest it is unlikely that the species would be present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. Potential indirect impacts from development, such as those associated with weed invasion and habitat disturbance, are unlikely to exacerbate existing threats to the species given the urban and agricultural landscape context and the distance of the nearest records to proposed development.
Prasophyllum validum	Sturdy Leek-orchid, Mount Remarkable Leek-orchid	Vulnerable	2	*Prasophyllum validum* (Sturdy Leek-orchid) is a tall terrestrial orchid with fragrant green and white flowers. Sturdy Leek Orchid occurs across inland Victoria and in the Flinders Ranges in South Australia. Populations in Victoria and South Australia are disjunct. Sturdy Leek-orchid grows in drier woodland habitats, usually with a low sparse understory. Victorian populations occur in box and box-ironbark woodland, with varying soils from heavy clays to sandy loams (M Duncan, 2010). As of 2010, the species was known from 18 populations with an associated 3,200 individuals. One population located at Mount Remarkable National Park in South

Scientific name	Common name	Listing status	Category	Justification
				Australia, contains almost 50 per cent of the total population. The Recovery Plan identifies nine populations in Victoria (M Duncan, 2010). Threats to the species include grazing and predation, weed invasion, disturbance or destruction, and climate change (M Duncan, 2010). The species has not been recorded within the Study Area. The nearest known population is located at Inverleigh Flora Reserve, around 21 km to the west of the Growth Areas. This population is noted in the Recovery Plan, and is estimated to support approximately 100 individuals. The species is unlikely to be directly impacted by the Plan. The absence of species records within or near the Strategic Assessment Area suggest the species is unlikely to be present. Further, The environmental features of the Strategic Assessment Area (which primarily consists of grasslands) are generally not suitable for this species (which occurs in woodlands). Direct impacts are therefore considered unlikely. Potential indirect impacts of development, such as those associated with weeds and habitat disturbance, are unlikely to exacerbate threats to the species given that there is minimal woodland areas in close proximity to the Growth Areas, and the distance of the nearest population to the proposed development.
Pterostylis chlorogramma	Green-striped Greenhood	Vulnerable	2	*Pterostylis chlorogramma* (Green-striped Greenhood) is a terrestrial herb which inhabits mixed Box-Stringybark forest with a shrubby understory. The species is restricted to gaps in the shrubby understory, or on road/track verges. The species is endemic to Victoria. It has a wide, though disjunct distribution from Yarram to Edenhope. The Green-striped Greenhood occurs in the Southeast Highlands, South East Coastal Plain, and Naracoorte Coastal Plain bioregions. The species is known from nine populations, containing approximately 1,000 plants. Threats to the species include weed invasion, grazing by native and introduced herbivores, destruction or disturbance and extinction related to small population sizes (Duncan, Pritchard and Coates, 2010). The Strategic Assessment Area is located within the Victorian Volcanic Plain bioregion. This is outside the range of the Green-striped Greenhood. Direct impacts are therefore considered unlikely. There is one record of the species within the Study Area (dated 2009), which occurs approximately 14.6 km away from the Growth Areas. This record is located on private land within the Brisbane Ranges, in a steep landscape covered with remnant vegetation. While the record is not located within the Brisbane Ranges National Park boundaries, the private land tenure and largely inaccessible nature of the landscape would afford the species protection from potential indirect impacts such as habitat disturbance.

Scientific name	Common name	Listing status	Category	Justification
				Other potential impacts from development such as weed invasion are unlikely to exacerbate existing threats to the species given the agricultural landscape context within which the Brisbane Ranges are located, and the distance of the nearest records to proposed development.
Pterostylis cucullata	Leafy Greenhood	Vulnerable	2	*Pterostylis cucullata* (Leafy Greenhood) is a herbaceous perennial orchid which is endemic to south-eastern Australia, occurring in SA, Victoria, and Tasmania. The species (including both subspecies) is known from around 110 populations comprising an estimated 50,000 plants. Approximately 92 of the known populations occur in Victoria (M. Duncan, 2010b). There are two subspecies, *Pterostylis cucullata* subsp. *sylvicola,* and *Pterostylis cucullata* subsp. *cucullata.* The two subspecies occupy different habitats and have different ranges (M. Duncan, 2010b). Subsp. *cucullata* occurs in coastal scrub on stabilised sand dunes, with an open understorey and herbaceous groundcover on sandy loam soils. In Victoria, this subspecies occurs between Nelson and Bairnsdale (M. Duncan, 2010b). The proposed development occurs within the broad distributional range of subsp. *cucullata*. In Victoria, subsp. *sylvicola* occurs in the eastern highlands, on montane riverbanks or alluvial terraces under various Eucalypt species, with scattered shrubs and herbaceous and grassy groundcover (M. Duncan, 2010b). The proposed development is outside the known distribution of subsp. *sylvicola.* Threats to the species include habitat loss and disturbance, weed invasion, grazing by introduced herbivores, grazing and trampling by stock, and frequent fires (M. Duncan, 2010b). The Strategic Assessment Area does not support coastal habitat suitable for subsp. *cucullata* and is outside of the range of subsp. *sylvicola.* It is considered unlikely that the species would be present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. There are no existing records within the broader Study Area. Suitable potential habitat for the species is limited due to the inland location of the project and distance from suitable coastal environments. Potential indirect impacts to the species are considered unlikely.
Rutidosis leptorrhynchoides	Button Wrinklewort	Endangered	2	*Rutidosis leptorrhynchoides* (Button Wrinklewort) is a perennial forb producing flowering stems during spring and summer. Within Victoria, the species grows in open strands of plains grassland and grassy woodlands. Button Wrinklewort is distributed in southeast Australia with disjunct populations in the ACT/NSW and Victoria. Within Victoria, the

Scientific name	Common name	Listing status	Category	Justification
				species is now restricted to a small refuge on the outskirts of Melbourne, Bannockburn, Rokewood, Wickliffe and between Beaufort and Ararat (OEH, 2012). As of 2012, there were 29 known natural populations, 11 of which occurred in Victoria. The total natural population at this time was estimated at 213,270 plants. In addition to the natural occurrences of the species, in 2012, there were five planted populations of the species in Victoria which contained approximately 1,300 plants (OEH, 2012). Targeted surveys for the Button Wrinklewort were conducted within the two Growth Areas. No individuals of the species were identified during these surveys. Further, assessment of habitat condition within the surveyed areas of the Growth Areas indicated that any potential habitat for the species would be marginal due to the presence of identified threats to the species in these areas (including physical disturbance, weeds, heavy grazing and unsuitable fire regimes) (EHP, 2021). It is noted that, in Victoria, the Button Wrinklewort occurs in sites which have been subject to little or no disturbance (OEH, 2012; SWIFFT, 2022a). Overall, it was considered highly unlikely that the species would be present within the surveyed areas of the Growth Areas (EHP, 2021). The unsurveyed areas of the Growth Areas are assumed to support habitat for the same threatened species which were recorded within the Growth Areas (see Section 13.3.2 of Part 3 for details). Given that these areas are more modified or degraded than the surveyed areas of the Growth Areas, and the species was not recorded during targeted surveys, potential direct impacts to Button Wrinklewort within the unsurveyed areas are unlikely. The broader Strategic Assessment Area has not been surveyed and will be subject to development within the external infrastructure footprints. The Plan includes a Measure to undertake targeted surveys within the external infrastructure footprints for all protected matters with the potential to occur. Any potential direct impacts to the species within these areas will be addressed following field surveys. There are a total of 313 records of the species within Victoria on the VBA. Of these, 81 records of the species occur within the Study Area. While the closest record occurs approximately 4.6 km away from the Growth Areas, this record was made in 1923 in an area which has since been developed. The nearest records with a better likelihood of persisting today occur 9 km away from the Growth Areas and separated by significant areas of urban and infrastructure development. Potential indirect impacts from development, such as those associated with weed invasion and habitat disturbance, are unlikely to exacerbate existing threats to the species given the urban and agricultural landscape context and the distance of the potentially extant records to proposed development.

Scientific name	Common name	Listing status	Category	Justification
Senecio macrocarpus	Large-fruit Fireweed	Vulnerable	2	*Senecio macrocarpus* (Large-fruit Fireweed) is a perennial daisy with yellow florets growing up to 70 cm in height. The species occurs in a variety of habitats including sedgelands, grasslands, shrublands and woodlands. The Large-fruit Fireweed is endemic to southeast Australia, occurring in Victoria, South Australia and formerly in Tasmania. In Victoria, the species is recorded widely, with records in the Murray Darling Depression, Victorian Volcanic Plain, Victorian Midlands and South Eastern Highlands bioregions (Sinclair, 2010). As of 2010, there were thought to be 14 populations containing an estimated 36,000 plants. Almost all of these plants (35,000) occurred in a single population in South Australia. 10 populations occurred in Victoria containing less than 1,000 plants (Sinclair, 2010). The main threats to the species include ongoing disturbance to and/or destruction of habitat, competition, weed invasion, and potentially climate change (Sinclair, 2010). Targeted surveys for the Large-fruit Fireweed were conducted within the two Growth Areas. No individuals of the species were identified during these surveys. Further, assessment of habitat condition within the surveyed areas of the Growth Areas indicated that any potential habitat for the species would be marginal due to low densities or absence of co-occurring species (such as Kangaroo Grass) and existing threats (including current or historical clearing and weed invasion). Subsequently, it was considered highly unlikely that the species would occur within the assessed areas of the Growth Areas (EHP, 2021). The unsurveyed areas of the Growth Areas are assumed to support habitat for threatened species which were recorded within the Growth Areas (see Section 13.3.2 of Part 3 for details). Given that these areas are more modified or degraded than the surveyed areas of the Growth Areas, and the species was not recorded during targeted surveys, potential direct impacts to Large Fruit Fireweed are unlikely. The broader Strategic Assessment Area has not been surveyed and will be subject to development within the external infrastructure footprints. The Plan includes a Measure to undertake targeted surveys within the external infrastructure footprints for all protected matters with the potential to occur. Any potential direct impacts to the species within these areas will be addressed following field surveys. There are 115 records of the species within the Study Area. All of these records are separated from the Growth Areas by significant urban and infrastructure development and are generally more than 8 km away. Potential indirect impacts from development, such as those associated with weed invasion and habitat disturbance, are unlikely to exacerbate existing threats to the species given the urban and agricultural landscape context and the distance of the records to proposed development.

Scientific name	Common name	Listing status	Category	Justification
Senecio psilocarpus	Swamp Fireweed	Vulnerable	2	*Senecio psilocarpus* (Swamp Fireweed) is a native perennial herb, flowering between November and March. The species occurs on high-quality herb-rich wetlands on plains. Wetland sites are typically inundated during winter and then become almost dry during summer (DEWHA, 2008c). Swamp Fireweed has a scattered distributed across western Victoria and southeast South Australia, where it is known from approximately 10 sites. Within Victoria, most populations occur in areas of less than 0.4 ha. Threats to the species are not well understood, but include grazing pressure by introduced herbivores and stock, weed invasion, trampling and changes to hydrology (DEWHA, 2008c). The species has not been recorded within the Growth Areas, and the Growth Areas are unlikely to provide suitable wetland habitat for the species. Modelling of wetland occurrence by DELWP (DELWP, 2022c) has identified two wetland areas in the NGGA. The first of these corresponds to a wastewater treatment plant adjacent to Anakie Road. The second of these appears to be related to two small farm dams (from aerial observations) located in the NGGA Conservation Area. This area was mapped as Plains Grassland (EVC 132) by (EHP, 2021). Overall, direct impacts are considered unlikely. There are no existing records within the broader Study Area. Suitable potential habitat is limited within a largely agricultural landscape. Potential indirect impacts to the species are also considered unlikely.
Xerochrysum palustre	Swamp Paper Daisy	Vulnerable	2	*Xerochrysum palustre* (Swamp Everlasting) is a perennial herb growing 30-100 cm tall with large yellow flowers. The species grows in wetlands including sedge-swamps and shallow freshwater marshes. It also grows in seasonally wet areas of native grassland and heath communities (DAWE, 2021e). Swamp Everlasting is endemic to southeast Australia and is widely distributed from south-east NSW, Victoria and north east Tasmania. In Victoria, the species has a wide though patchy distribution from Bairnsdale to the Cobberas and Nunniong Plateau. The species is likely to have been historically abundant in ephemeral wetlands prior to their conversion for agriculture, particularly across southern Victoria (DAWE, 2021e). Population estimates are approximate as the rhizomatous habitat makes estimating difficult. There are thought to be over 12,000 plants in Victoria, over 15,000 in NSW, and fewer than 5,000 in Tasmania (DAWE, 2021e). Threats to the species include climate change, habitat loss, disturbance and modifications including changed hydrology, impacts from invasive species including browsing by

Scientific name	Common name	Listing status	Category	Justification
				introduced herbivores and competition with weeds, grazing from overabundant native fauna and genetic threats due to small and fragmented populations (DAWE, 2021e). The species has not been recorded within the Growth Areas, and the Growth Areas are unlikely to provide suitable wetland habitat for the species. Modelling of wetland occurrence by DELWP (DELWP, 2022c) has identified two wetland areas in the NGGA. The first of these corresponds to a wastewater treatment plant adjacent to Anakie Road. The second of these appears to be related to two small farm dams (from aerial observations) located in the NGGA Conservation Area. This area was mapped as Plains Grassland (EVC 132) by (EHP, 2021). Overall, direct impacts are considered unlikely. There is one record of the species within the Study Area (dated 1995), occurring approximately 14 km south-east of the Growth Areas. This record is separated from the Growth Areas by significant areas of urban and infrastructure development. Potential indirect impacts from development, such as those associated with weed invasion, habitat disturbance, or change to hydrology, are unlikely to exacerbate existing threats to the species given the urban and agricultural landscape context, the age of the record and the distance of the record to proposed development.
Mammals				
Balaenoptera musculus	Blue Whale	Endangered, migratory	2	*Balaenoptera musculus* (Blue Whale) occurs in all waters surrounding Australia and migrates between low-latitude breeding grounds where both mating and calving take place during the winter and high-latitude feeding grounds during the summer. The population globally and nationally is unknown. Threats to the species include whaling, climate change, noise interference, habitat modification, vessel disturbance, and overharvesting of prey (DoE, 2015b). The species has not been recorded within the marine environment of the Study Area and will not be affected by development under the Plan.
Eubalaena australis	Southern Right Whale	Endangered, Cetacean, migratory	2	*Eubalaena australis* (Southern Right Whale) only occurs in the Southern Hemisphere. In Australian coastal waters, the species is found along the southern coastline from Perth to Sydney, and Tasmania. Calving takes places very close to the Australian coast, generally in waters less than 10 metres deep. Female-calf pairs generally stay within the calving ground for 2-3 months. Females demonstrate calving site fidelity. Estimates suggest that the global population exceeds 12,000 whales, and approximately 3,500 occur in Australia. Threats to the species include entanglement, vessel disturbance, whaling, climate change, noise interference, habitat modification, and overharvesting prey (DSEWPaC, 2012b).

Scientific name	Common name	Listing status	Category	Justification
				There are two records of the species within the marine environment of the Study Area, approximately 17.7 km away from the Growth Areas at Kirk Point. The species is a marine species with a global distribution and will not be affected by proposed development under the Plan.
Isoodon obesulus obesulus	Southern Brown Bandicoot	Endangered	2	*Isoodon obesulus obesulus* (Southern Brown Bandicoot) is a medium size marsupial which inhabits dense vegetation, wetland fringes and heathland. They are secretive and do not venture far from cover. The species forages in leaf litter for insects, fungi, plant root nodules and bulbs. The species home ranges are usually between 0.5 - 5 ha. The species occurs across NSW, Victoria and SA. Within Victoria, records are clustered in the East Gippsland Lowlands, Gippsland Plain, Otway Plain, Warrnambool Plain, Greater Grampians, Glenelg Plains and Wilsons Promontory bioregions. Populations in Victoria are experiencing decline, including south-east Melbourne, west Gippsland, Mornington Peninsula and Western Port. All populations appear to be at low or very low densities (TSSC, 2016k). In Victoria there is an estimated 14,700 - 264,000 individuals in east Gippsland, "very low hundreds" in Western Port and "very low thousands" in between Wilsons Promontory and Melbourne (TSSC, 2016k). The species is highly susceptible to habitat loss and fragmentation with evidence of population loss in cleared areas. The species is also threatened by predation by foxes and cats, frequent and extensive burning, and habitat degradation (TSSC, 2016k). The species has not been recorded within the Strategic Assessment Area. Further, suitable habitat for the species is not present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. There are four records of the species within the Study Area. The closest record occurs 8.6 km to the south of the Growth Areas along the Barwon River riparian corridor. However, the record was made in 1964 and the environment is now highly urbanised. The remaining two records occur further south (between 15 km and 18 km) within an agricultural setting and both observations are also now dated (made in 1971 and 1981). It is unlikely that indirect impacts will affect the species given the lack of recent records within the Study Area and the generally unsuitable nature of the environment.
Mirounga leonina	Southern Elephant Seal	Vulnerable	2	*Mirounga leonina* (Southern Elephant Seal) has a nearly circumpolar Southern Hemisphere distribution, with most breeding colonies occurring on sub-Antarctic islands. In Australia, the species mainly breeds on Macquarie Island and Heard Island. Some individuals disperse north to the mainland Australian coast, and some disperse south to Antarctica. The species spends most of its life at sea and can disperse thousands of kilometres from breeding colony sites. Global population is estimated at 650,000 in the mid-1990's, and

Scientific name	Common name	Listing status	Category	Justification
				currently classified as Least Concern by IUCN. Threats include climate change, fisheries bycatch and entanglement, prey depletion due to overfishing, and marine pollution (TSSC, 2016g). There are ten records of the species within the marine environment of the Study Area. The species is a marine species with a global distribution and will not be affected by development under the Plan.
Perameles gunnii	Eastern Barred Bandicoot (Mainland)	Endangered	2	*Perameles gunnii* (Eastern Barred Bandicoot (Mainland)) is a ground-dwelling marsupial that inhabits native perennial tussock grasslands and grassy woodlands with dense cover for nesting, adjacent to open areas for feeding. The species is endemic to south-eastern Australia. All wild subpopulations have been presumed to be extinct since 2002. However, reintroductions have been attempted at eight sites within its former range and three sites outside of the historical range. These subpopulations are all enclosed by predator-barrier fences. Threats to the species include invasive species, small population size, habitat loss, disturbance or modification, climate change, and disease (DAWE, 2021c). The species has not been recorded within the Strategic Assessment Area. Further, suitable habitat for the species is not present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. There are 36 historical records of the species within the Study Area (the most recent occurring in 1980). It is unlikely that any of these records are extant. One reintroduction site occurs within the Study Area, at Mount Rothwell Biodiversity Interpretation Centre adjacent to You Yangs Regional Park approximately 14 km from the Growth Areas. This population will not be affected indirectly as a result of development under the Plan, given the population is highly managed and located some distance from the Growth Areas.
Petaurus australis australis	Yellow-bellied glider	Vulnerable	2	*Petaurus australis australis* (Yellow-bellied glider) is a medium sized marsupial which has a widespread though patchy distribution from south-eastern Queensland through NSW and VIC to near the SA-VIC border. In Victoria, 75 per cent of the species records are in the eastern portion of the state from the east coast to Melbourne and Port Phillip bay. The Yellow-bellied glider occurs in eucalypt dominated woodlands and forests, including both dry and wet sclerophyll forests. Habitat suitability is determined by forest age and floristics- the species demonstrates a preference for large patches of mature old growth forest which provide trees for foraging and shelter. There is no reliable estimate of the population size of the species, it is considered likely that there are less than 100,000 mature individuals. Threats to the species include habitat loss, disturbance and modification, climate change, predation and habitat degradation by introduced species, and fencing of agricultural land (DAWE, 2022b).

Scientific name	Common name	Listing status	Category	Justification
				The species has not been recorded within the Strategic Assessment Area. Further, suitable habitat for the species is not present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. There are also no existing records within the broader Study Area. Suitable potential habitat is limited within a largely agricultural landscape. Potential indirect impacts to the species are therefore considered unlikely.
Petrogale penicillata	Brush-tailed Rock-wallaby	Vulnerable	2	*Petrogale penicillata* (Brush-tailed Rock-wallaby) is a medium sized marsupial occurring in NSW, south-east Queensland, and small parts of Victoria. The species distribution has declined dramatically, and it now has a disjunct range across south-eastern Australia. It is mostly associated with the Great Dividing Range, occurring between the Grampians in Victoria to Yarraman in south eastern Queensland. The species spends the day basking and resting in rocky areas such as rock outcrops and faces. They forage at night in grassy woodland and forest habitats. Home range is approximately 15 km. In 2008, the population size was estimated to be between 15,000 to 30,000 individuals, with less than one per cent of the population occurring in Victoria (DAWE, 2021a). Threats to the species include predation by foxes, wild dogs and cats, competition and habitat degradation from goats, horses and rabbits, weed invasion, climate change impacts including inappropriate fire regimes, increased temperatures and changes to precipitation patterns, land clearing, road mortality, hunting, and diseases (hydatid disease and toxoplasmosis) (DAWE, 2021a). There is one record of the species within the Study Area, dated 2022. This record is located south of Little River, in the north of You Yangs National Park (approximately 16 km north of the NGGA). The species has not been recorded within the Strategic Assessment Area. Further, suitable habitat for the species is not present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. Indirect impacts to the species from development under the Plan are considered unlikely, given the limited records of the species in the broader region, and the distance of the known record from the Strategic Assessment Area.
Pseudomys novaehollandiae	New Holland Mouse, Pookila	Vulnerable	2	*Pseudomys novaehollandiae* (New Holland Mouse) is a small terrestrial rodent, similar in appearance to the introduced house mouse. New Holland Mouse has a fragmented and disjunct distribution across southern Queensland, the ACT, NSW, Victoria and Tasmania. It is primarily coastal, though occurs up to 100 km inland. The species mainly occurs in the mid and north coasts of NSW and into southern Queensland. There has been significant declines in Tasmania and Victoria since 2010, and there are three isolated remnant

Scientific name	Common name	Listing status	Category	Justification
				populations in Victoria (Anglesea, Wilsons Promontory, and Gippsland Lakes). New Holland Mouse occurs in open heathlands, open woodlands with a heathland understory, woodland with a grassy understory, vegetated sand dunes, and tall open forest with a grassy understory. There is limited information available on the dispersal behaviours of the species. Studies in Tasmania have recorded up to 206 m of movement in one night, with an estimated home range of 0.44 to 1.4 ha (DCCEEW, 2024k). Threats to the species include an increase in fire frequency or severity, habitat loss and degradation, *Phytophthora cinnamomi* infestation, predation by cats and foxes and competition from introduced rodents. Predation by foxes and cats, along with other threats, may have had a strong influence on the species range and current occurrence (DCCEEW, 2024h. There are no records of the species within the Study Area. The nearest records of New Holland Mouse are located south of the Study Area, associated with Anglesea Heath, approximately 23 km south of the WGGA. Given the distance of the nearest records from the Strategic Assessment Area, and the agricultural landscape of the Growth Areas, direct and indirect impacts to the species are considered unlikely.
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	2	*Pteropus poliocephalus* (Grey-headed Flying-fox) is a bat endemic to Australia, with a distribution ranging from central QLD to SA extending from the coast inland to the western slopes of NSW. The species is highly mobile and adaptable to changes in habitat. It is found in a wide range of vegetation communities, including rainforests, open forests, closed and open woodlands, Melaleuca swamps, and Banksia woodlands. Roost sites are typically located near water sources, such as lakes, rivers, or the coast. The species is considered to be a single mobile population, estimated between 320,000 and 435,000 individuals. Threats to the species include habitat loss, camp disturbance, mortality in commercial fruit crops, heat stress, entanglement in netting and barb wire fencing, climate change, bushfires, electrocution on power lines, and public misunderstanding of disease (DAWE, 2021g). There are no VBA records of the species within the Strategic Assessment Area. It is noted that a recent survey south-east of the WGGA (within the Strategic Assessment Area) incidentally observed Grey-headed Flying-fox (DJCS, 2023). However, suitable habitat for the species is not present within the Growth Areas, given that these areas predominantly comprise grassland habitats or cropped fields. Direct impacts are therefore considered unlikely. There are 29 records of the species within the Study Area, the closest of which occurs 5.4 km from the Growth Areas. The Geelong, Eastern Park nationally important Grey-headed

Scientific name	Common name	Listing status	Category	Justification
				Flying-Fox camp occurs within the Study Area, approximately 7.7 km from the Growth Areas. Development within the Growth Areas is unlikely to impact the species indirectly or exacerbate any existing threats to the species within the region.
Birds				
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	2	*Anthochaera phrygia* (Regent Honeyeater) is a bird which generally inhabits box-ironbark eucalypt woodland and dry sclerophyll forest as well as riparian vegetation. Its diet consists of nectar, invertebrates and their exudates, and occasionally fruit. Breeding territories include the nest-tree and surrounding feeding areas with nesting occurring in the canopy of mature trees with rough bark. It is endemic to mainland south-eastern Australia with a distribution that extends from south-east QLD to central VIC. The species primarily occurs along the inland slopes of the Great Dividing Range, in areas of low to moderate relief with moist, fertile soils. There are four known key breeding areas: three in NSW and one in VIC. The species comprises a single population, estimated at 1500 individuals in 2010. Threats include small population size, habitat loss and fragmentation, habitat degradation, and competition with other nectivorous birds and honeybees (DoE, 2016). The species has not been recorded within the Strategic Assessment Area. Further, suitable habitat for the species is not present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. There are five historical records of the species (dated 1895 – 1993) within the Study Area. Potential indirect impacts from development, such as those associated with weeds, are unlikely to affect the species – especially given the lack of recent records and limited suitable habitat for the species.
Aphelocephala leucopsis	Southern Whiteface	Vulnerable	2	The Southern Whiteface has a very wide distribution, occurring across most of Australia south of the tropics, from western WA to eastern NSW, and through SA and VIC. The species occurs in open woodlands and shrublands, and forages on insects, spiders and seeds. Habitat critical to the survival of the species includes relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs, or both; habitat with low tree densities and an herbaceous understory litter cover which provides essential foraging habitat; and living and dead trees with hollows and crevices which are essential for roosting and nesting. Threats to the species include large scale land clearing for agriculture, habitat degradation due to grazing, and climate change (DCCEEW, 2023a). The Plan will not result in direct impacts to suitable habitat for this species within the Growth Areas, as the Growth Areas support grassland and open agricultural environments, which are not consistent with habitat requirements of the species.

Scientific name	Common name	Listing status	Category	Justification
				There are multiple records in the VBA database of the Southern Whiteface within the Study Area. Records are mostly concentrated on the limited areas of remnant woodland located some distance from the Growth Areas which are unlikely to be impacted under the Plan. Other than these woodland remnants, the Study Area provides very limited suitable habitat for the species. Development under the Plan is unlikely to affect the species or contribute to any recognised threats.
Ardenna grisea	Sooty Shearwater	Vulnerable, migratory	2	*Ardenna grisea* (Sooty Shearwater) is a large seabird which occurs in the southern hemisphere during summer and spends the non-breeding season in the North Pacific Ocean, the North Atlantic ocean, or remains in the southern hemisphere. In Australia, the species breeds on islands off NSW and Tasmania. Foraging occurs at sea. The species is a moderately common migrant and visitor to Victoria and South Australia. The Australian breeding population is estimated to be 6,500 mature individuals (DCCEEW, 2023b). There are currently no land-based threats to the sooty shearwater in Australia. The development of offshore windfarms is an emerging threat to the species (DCCEEW, 2023b). One individual of Sooty Shearwater has been recorded within the Study Area. Given the limited records within the Study Area, and that species forages at sea and breeds on offshore islands, potential direct or indirect impacts from development under the Plan are unlikely.
Arenaria interpres	Ruddy Turnstone	Vulnerable	2	*Arenaria interpres* (Ruddy Turnstone) is a medium sized wader. The species breeds on the coasts of Asia, Europe and North America, and migrates to Australia during the non-breeding season. In Australia, the Ruddy Turnstones is widespread, and occurs mostly in coastal regions. The species feeds over the whole tidal range, and roosts on shelves or platforms of shingle, rock or gravel beaches. In 2020, the Australian population was estimated to be 20,800 individuals (DCCEEW, 2024a). Threats to the species include habitat loss and degradation from development, industrial aquaculture, the effects of large dams, and seaweed harvesting, along with invasive species, human disturbance, climate change, hunting, and pollution (DCCEEW, 2024a). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 321 records of the species within the Study Area. Records of the species mostly occur on the shoreline of Port Phillip bay, primarily between Avalon Beach and little River Bird Hide. Scattered records occur around Point Henry. Development under the Plan is

Scientific name	Common name	Listing status	Category	Justification
				unlikely to result in notable indirect impacts to these areas due to the significant existing development surrounding Port Phillip Bay.
Botaurus poiciloptilus	Australasian Bittern	Endangered	1	*Botaurus poiciloptilus* (Australasian Bittern) is a bird which occurs mainly in freshwater wetlands, and more rarely in estuaries or tidal environments. Wetlands with tall, dense vegetation are favoured. Foraging occurs in still, shallow water, or from vegetation platforms over deeper water (TSSC, 2011a). Nesting occurs in deep, densely vegetated freshwater swamps and pools (TSSC, 2019a). The Australasian Bittern occurs in New Zealand, New Caledonia, and Australia. In Australia the species occurs in south-eastern Australia, including southern Queensland, NSW, Victoria, SA, and Tasmania. It also occurs in the south-west of WA. In Victoria, the species is recorded mostly in the southern coastal areas and in the Murray River region of central northern Victoria (TSSC, 2019a). The Australasian Bittern occurs as two sub-populations: one in south-eastern Australia and the other in south-western Australia (TSSC, 2019a). In 2011, the total Australian population was estimated at 1,000 mature individuals (Garnett, Szabo and Dutson, 2011) Threats to the species include habitat loss, habitat degradation, climate change, inappropriate placement of infrastructure (such as fence lines and powerlines), water quality impacts, disturbance, and introduced animals (TSSC, 2019a). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 179 records of the species, with numerous records occurring downstream in the Lake Connewarre Complex. The Australasian Bittern is identified as part of the Ramsar listing criteria for this site (DELWP, 2020). Multiple records also occur along the coastline near Port Wilson. Potential indirect impacts to the species as a result of development may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Australasian Bittern.
Calidris acuminata	Sharp-tailed Sandpiper	Vulnerable	1	*Calidris acuminata* (Sharp-tailed Sandpiper) is a small to medium migratory bird. The species breeds in northern Siberia, and most of the population migrates to Australia and New Zealand in the non-breeding season. Sharp-tailed Sandpipers occur in all states of Australia. The species is widespread in most regions of Victoria especially in coastal areas. Sharp-tailed Sandpipers feed at the edge of water on mudflats, coastal and inland wetlands and

Scientific name	Common name	Listing status	Category	Justification
				sewage ponds. Roosting occurs on rocky and sandy beaches, inland saltwater habitats and freshwater habitats. The total population was estimated to be 72,900 individuals in 2020 (DCCEEW, 2024b). Threats to the species include habitat loss, degradation and fragmentation caused by development, industrial aquaculture, agriculture, and large dams, along with climate change, sea level rise, invasive species, pollution, exploitation and fishing bycatch (DCCEEW, 2024b). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 1,531 records of the species within the Study Area, mostly associated with areas around the Spit, Avalon Beach, Point Henry, and the Lake Connewarre Complex. The species is identified as part of the Ramsar listing criteria for the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site. The Ramsar site is also known to regularly support over 1 per cent of the total population of the Sharp-tailed Sandpiper (DELWP, 2020). Potential indirect impacts to the species as a result of development may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Sharp-tailed Sandpiper.
Calidris canutus	Red Knot	Vulnerable, marine, migratory	1	*Calidris canutus* (Red Knot) is a migratory shorebird which breeds in the Arctic and migrates to Australia during the non-breeding period. The species occurs around the entire coastline of Australia. However, it is less numerous in south-western Australia and very large numbers occur in north-west Australia (DCCEEW, 2024c). The species mainly inhabits coastal environments and occasionally saline wetlands near the coast . The species forages on intertidal mudflats, sandflats and sandy beaches. Foraging activity is regulated by the tide. Roosting occurs on mudflats, non-tidal swamps, lakes and lagoons near the coast (DCCEEW, 2024c). The global population of the Red Knot was estimated at 110,000 in 2016, with 68,900 individuals occurring in Australia. There are six recognised subspecies of the Red Knot, of which two have been recorded in Australia (one occurring almost exclusively in the north-west, one occurring mostly in the east) (DCCEEW, 2024c).

Scientific name	Common name	Listing status	Category	Justification
				There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 553 records of the species within the Study Area, scattered along the coastline of Port Phillip and downstream associated with the Lake Connewarre Complex (part of the Port Philip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site). The Red Knot is identified as part of the Ramsar listing criteria for this site (DELWP, 2020). Potential indirect impacts to the species as a result of development may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Red Knot.
Calidris ferruginea	Curlew Sandpiper	Critically Endangered, marine, migratory	1	*Calidris ferruginea* (Curlew Sandpiper) is a migratory shorebird. The species visits Australia during the non-breeding season, where it primarily occurs along the coastline and is also widespread inland (DCCEEW, 2023c). The Curlew Sandpiper uses a range of freshwater and brackish coastal, estuarine, and inland waterbodies. It forages on mudflats and nearby shallow water. Roosting generally occurs around mudflats in inlets, bays, estuaries and lagoons. The species' diet primarily consists of invertebrates, but it will also eat seeds (DCCEEW, 2023c). Threats to the species include ongoing human disturbance, habitat loss and degradation, changes to water regimes, climate change and invasive plants (DCCEEW, 2023c). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 2,942 records of the species within the Study Area. Records occur along the coastline of Port Phillip and downstream associated with the Lake Connewarre. The Curlew Sandpiper is identified as part of the Ramsar listing criteria for the Port Philip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site. The site is also known to regularly support over 1 per cent of the total population of the Curlew Sandpiper (DELWP, 2020). Potential indirect impacts to the species as a result of development may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Curlew Sandpiper.
Calidris tenuirostris	Great Knot	Vulnerable, marine, migratory	1	*Calidris tenuirostris* (Great Knot) is a migratory shorebird that breeds in the Northern Hemisphere and migrates south during the non-breeding period (DCCEEW, 2024d).

Scientific name	Common name	Listing status	Category	Justification
				It occurs along the entirety of the Australian coast with a few records scattered inland. The greatest numbers have been recorded in northern WA, and the NT. The species is much less common in south-west Australia, SA, Victoria and Tasmania (DCCEEW, 2024d). Within Australia, the Great Know forages on intertidal mudflats and sandflats. Roosting habitat includes inlets, bays, lagoons and estuaries, often close to foraging habitat (DCCEEW, 2024d). In 2020, the Australian population was estimated to be 386,900 mature individuals (DCCEEW, 2024d). Threats to the species include habitat loss and degradation, pollution, disturbance, diseases, direct mortality, and climate change impacts (DCCEEW, 2024d). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 87 records of the species within the Study Area, scattered along the coastline of Port Phillip and downstream associated with the Lake Connewarre Complex (part of the Port Philip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site). The Great Knot is identified as part of the Ramsar listing criteria for this site (DELWP, 2020). Potential indirect impacts to the species as a result of development may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Great Knot.
Callocephalon fimbriatum	Gang-Gang Cockatoo	Endangered	2	*Callocephalon fimbriatum* (Gang-Gang Cockatoo) is a small, stocky cockatoo endemic to south-eastern Australia. The species occurs in NSW, ACT, and Victoria. In Victoria, the Gang-gang cockatoo is widespread throughout southern and north-east regions. Records occur in east Melbourne, Mornington Peninsula, and south-western Gippsland. The total population of mature individuals was estimated at 25,200 in 2021 (DAWE, 2022a). The species primarily occurs within temperate eucalypt forests and woodlands. In the summer, Gang-Gang Cockatoos inhabit mature, wet sclerophyll forests, along with more open eucalypt assemblages, subalpine snow gum woodland, temperate rainforests, and regenerating forests. In winter, the species inhabits woodlands at drier, lower altitudes-often occurring in more open eucalypt assemblages, along with suburban city areas. Foraging is mainly arboreal, and rarely occurs at shrub or ground level. The species feeds on flower buds, seed pods, and other plant matter from a wide range of native and introduced species (DAWE, 2022a).

Scientific name	Common name	Listing status	Category	Justification
				Threats to the species include inappropriate fire regimes, climate change (including warmer weather and altered rainfall), competition for nest follows with other species, nest predation by the Common Brushtail Possum, Psittacine beak and feather disease, and habitat loss and degradation (DAWE, 2022a). The species has not been recorded within the Growth Areas. Given that the species is strongly associated with woodlands and forests, nesting in tree hollows and foraging mainly arboreally, it is considered unlikely that the species would utilise grassland habitat of the Growth Areas. Direct impacts are therefore considered unlikely. There are 517 records of the species within the Study Area, most of which occur near to the Barwon River in the centre of Geelong in urban areas. Urban-based threats are already present within this environment. It is considered unlikely that development under the Plan would exacerbate existing landscape threats to the species which are present in these environments.
Charadrius leschenaultii	Greater Sand Plover	Vulnerable, marine, migratory	1	*Charadrius leschenaultii* (Greater Sand Plover) is a shorebird that breeds in the Northern Hemisphere and migrates south during non-breeding periods. The species is widespread across Australia and is most common in the north-west (TSSC, 2016a). In Australia, the species is almost entirely coastal. It inhabits sheltered beaches, intertidal mudflats, sandbanks, salt marshes, estuaries, coral reefs, rocky islands or platforms, tidal lagoons and dunes near the coast. Foraging typically occurs in wet sand or mud, and roost on sand-spits or high on banks near beaches (DCCEEW, 2023c). In 2020, the Australian population was estimated to be 126,300 individuals (DCCEEW, 2023c). Threats to the species within Australia include human disturbance, climate change, hunting, and habitat loss and degradation caused by pollution and changes to the water regime, and invasive plants, large dams, and invasive plants (DCCEEW, 2023c). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 15 records of the species within the Study Area, scattered along the coastline of Port Phillip and downstream associated with the Lake Connewarre Complex (part of the Port Philip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site). The Greater Sand Plover is identified as part of the Ramsar listing criteria for the Ramsar site (DELWP, 2020).

Scientific name	Common name	Listing status	Category	Justification
				Potential indirect impacts to the species as a result of development may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Greater Sand Plover.
Climacteris picumnus victoriae	(Brown Treecreeper (south-eastern))	Vulnerable	2	The Brown Treecreeper (south-eastern) occurs in south-eastern Australia, from the Grampians in western Victoria, through central New South Wales to the Bunya Mountains in Queensland, and from the coast to the inland slopes of Great Dividing Range. Records of the subspecies mostly occur in inland environments, and the species is less commonly found in coastal environments (DCCEEW, 2023c). The species occupies dry open eucalypt forests and woodlands with a dense shrub layer and is not present in heavily degraded woodlands. Habitat critical to the survival of the species is proposed to include relatively undisturbed grassy woodlands with native understory; large living and dead trees which are essential for roosting and nesting sites and for foraging; fallen timber which provides essential foraging habitat and; hollows in standing dead or live trees and tree stumps are also essential for nesting (DCCEEW, 2023c). The species is thought to be unable to cross habitat gaps and are thought to require remnant vegetation fragments of at least 300 ha to maintain population viability (DCCEEW, 2023c). Threats to the species includes habitat loss, degradation and fragmentation caused by agriculture, over-grazing of livestock, and firewood collection, along with climate change, inappropriate fire regimes, competition with noisy miners for tree hollows, fox and cat predation, and grazing pressure from kangaroos and rabbits (DCCEEW, 2023e).The Plan will not result in direct impacts to suitable habitat for this species within the Growth Areas, as the Growth Areas support grassland and open agricultural environments, which are not consistent with habitat requirements of the species. There are multiple records in the VBA database of the Brown Treecreeper (south-eastern) within the Study Area. Records are concentrated on the limited areas of remnant woodland located some distance from the Growth Areas which are unlikely to be impacted under the Plan. Other than these woodland remnants, the Study Area provides very limited suitable habitat for the species. Development under the Plan is unlikely to affect the species or contribute to any recognised threats.
Charadrius mongolus	Lesser Sand Plover	Endangered, marine, migratory	1	*Charadrius mongolus* (Lesser Sand Plover) is a shorebird that breeds in the Northern Hemisphere and migrates south during non-breeding periods. Within Australia, the Lesser

Scientific name	Common name	Listing status	Category	Justification
				Sand Plover has been recorded in all states, although it mostly occurs in northern and eastern Australia (TSSC, 2016b). In Australia, the species is almost strictly coastal and prefers sandy beaches, mudflats of coastal bays and estuaries, sand flats and dunes near the coast, and occasionally mangrove mudflats. Foraging mostly occurs at intertidal sandflats and mudflats in estuaries or beaches or in shallow ponds. Occasional foraging may occur in other coastal and aquatic habitats. Roosting occurs on beaches, banks, spits and banks of sand or shells (TSSC, 2016b). The most recent population estimate of the species present in the East Asian-Australasian Flyway is 180,000 – 275,000 (Hansen *et al.*, 2016). Four of the five subspecies occur in the East Asian-Australasian Flyway, of these, two occur in Australia during the non-breeding season including *Charadrius mongolus* subsp. *mongolus*, and *Charadrius mongolus* subsp. *stegmanni* (TSSC, 2016b). Threats to the species in Australia include human disturbance, pollution and changes to the water regime, and invasive plants (TSSC, 2016b). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 58 records of the species within the Study Area, associated with Port Phillip (including the coastline of the bay in addition to the body of the bay itself). The Lesser Sand Plover is identified as part of the Ramsar listing criteria for the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site (DELWP, 2020). Potential indirect impacts to the species as a result of development may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Lesser Sand Plover.
Diomedea antipodensis	Antipodean Albatross	Vulnerable, marine, migratory	2	*Diomedea antipodensis* (Antipodean Albatross) is considered a foraging species in that the bird forages, but does not breed, within areas under Australian jurisdiction. The species is endemic to New Zealand but forages widely off the coast of NSW. The albatross is marine, pelagic, and aerial. During non-breeding periods, the species rests and sleeps on the ocean. Its diet primarily consists of cephalopods, fish, and crustaceans. The population is estimated at 25,260. Main threats to the species include incidental catch (due to longline fishing, trawl fishing, and trolling operations and intentional shooting (DCCEEW, 2022a). The species has not been recorded within the Study Area and will not be affected by development under the Plan.

Scientific name	Common name	Listing status	Category	Justification
Diomedea epomophora	Southern Royal Albatross	Vulnerable, marine, migratory	2	*Diomedea epomophora* (Southern Royal Albatross) is endemic to New Zealand with 99 per cent breeding on Campbell Island and the remaining 1 per cent in the Auckland Islands. In Australia, the albatross is distributed along the southern coastline (DCCEEW, 2022a). The species does not breed in Australia. Its diet primarily consists of cephalopods, fish, and tunicates (ACAP, 2004). The Campbell population is estimated at 7,800 breeding pairs between 2004- 2008. Threats to the species may include incidental catch and invasive native species (BirdLife International, 2022b). The species has not been recorded within the Study Area and will not be affected by development under the Plan.
Diomedea exulans	Wandering Albatross	Vulnerable, marine, migratory	2	*Diomedea exulans* (Wandering Albatross) is solitary or gregarious at sea and breeds in colonies. In Australia, the species breeds on Macquarie Island and forages in the Australian portions of the Southern Ocean. The albatross is marine, pelagic, and aerial. Its diet primarily consists of squid and fish followed by crustaceans and carrion (DCCEEW, 2022a). There are an estimated 20,100 birds globally. Threats to the species may include incidental catch, predation by invasive species, and shifts in the oceanic habitat (BirdLife International, 2022c). There are 16 historical records of the species within the Study Area (observed 1951 – 1979). The species will not be affected by development under the Plan.
Diomedea sanfordi	Northern Royal Albatross	Endangered, marine, migratory	2	*Diomedea sanfordi* (Northern Royal Albatross) is marine, pelagic, and aerial and inhabits subantarctic, subtropical, and occasionally Antarctic waters. Its diet primarily consists of cephalopods, fish, crustaceans, and salps (i.e., pelagic tunicates). In Australia, the albatross has been sighted in Australian waters off south-eastern Australia. There is a total population of approximately 20,000 individuals. Threats to the species include mortality related to longline fishing and collisions, loss of food stock, ingestion, or marine debris and pollution (DCCEEW, 2022a). The species has not been recorded within the Study Area and will not be affected by development under the Plan.
Falco hypoleucos	Grey Falcon	Vulnerable	2	*Falco hypoleucos* (Grey Falcon) is endemic to mainland Australia and occurs in arid and semi-arid Australia. In Victoria, the species appears to be absent from south of the Great Dividing Range. Habitat for the species consists of timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. While breeding, the species' diet consists almost exclusively of birds, including doves, pigeons, small parrots and cockatoos, and finches. Nesting generally occurs in the tallest trees along watercourses, particularly Red River Gum and Coolibah. The estimated number of mature individuals is

Scientific name	Common name	Listing status	Category	Justification
				less than 1,000. Threats to the species include predation by cats, climate change impacts, demographic and genetic stochastic events, habitat loss and fragmentation, nest shortage, disturbance, direct mortality, and harvesting (TSSC, 2020b). The species has not been recorded within the Strategic Assessment Area. Further, suitable habitat for the species is not present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. There are also no existing records within the broader Study Area. Potential for occurrence is limited. Indirect impacts to the species are considered unlikely.
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	Vulnerable	1	*Gallinago hardwickii* (Latham's Snipe) is a medium sized wader with a long, straight bill. They breed in Japan and far eastern Russia, and visit Australia during the non-breeding season. The species has been recorded across the east coast of Australia from south Australia to Cape York. In Victoria, the species occurs in all regions except for the north-west. Latham's Snipe feeds in shallow water or soft mudflats. Roosting occurs in small wetlands such as saltmarshes urban water bodies, and creek edges, mostly under dense cover. The population visiting Australia is estimated to be 19,000 mature individuals (DCCEEW, 2024e). Threats to the species include habitat loss, fragmentation and degradation caused by development and high intensity grazing, increased severity or frequency of drought or fire, predation from cats and foxes, invasion of broad-leaved tea- tree, and hunting (DCCEEW, 2024e). There are 858 records of Latham's Snipe within the Study Area. Most of these records are located either within the downstream reaches of the Barwon River or within the Lake Connewarre wetland complex. One of the recent records occurs within the Strategic Assessment Area adjacent to Cowies Creek, approximately 600 m east of the boundary of WGGA. A small number of recent individuals have been recorded in proximity to Limeburners Lagoon, slightly upstream of the Lagoon. Potential indirect impacts to the species as a result of development may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of Latham's Snipe.
Grantiella picta	Painted Honeyeater	Vulnerable	2	*Grantiella picta* (Painted Honeyeater) is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory. Breeding occurs on the inland slopes of the Great Dividing Range between the Grampians, VIC and Roma, QLD. The species has a specialised diet consisting of primarily mistletoe fruits as well as nectar and arthropods. The honeyeater exhibits a preference for woodlands with a high composition of

Scientific name	Common name	Listing status	Category	Justification
				mature trees since these host more mistletoes. Nesting also occurs primarily in areas with a high concentration of mistletoes. The population was estimated at <10,000 individuals in 2011. Threats to the species include habitat loss, competition with the aggressive noisy miner, predation by invasive species, deliberate destruction of mistletoe, exacerbation of tree decline, collision with road vehicles, and nest predation (DoE, 2015d). The species has not been recorded within the Strategic Assessment Area. Further, suitable habitat for the species is not present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. There are 36 records of the species within the Study Area, associated with the limited areas of remnant woodland. The closest record occurs 8 km from the Growth Areas. The potential indirect impacts of development are unlikely to affect the species or exacerbate threats given the sparsity of suitable habitat within the landscape and the distance of the nearest records to proposed development.
Halobaena caerulea	Blue Petrel	Vulnerable	2	*Halobaena caerulea* (Blue Petrel) breeds on numerous subantarctic islands. In Australia, breeding is restricted to offshore stacks near Macquarie Island. The main factor that is the cause of the species' Vulnerable listing is its small EOO due to its limited breeding habitat. The species forages in Antarctica and subantarctic waters for pelagic crustaceans, fish, cephalopods and insects. The population at Macquarie Island (Australian population) estimated to be 500-600 pairs in 1979. In 2011, the global population was estimated to be 80,000 individuals. Threats to the species include nest destruction by invasive species (TSSC, 2015a). There is one historical record of the species within the Study Area (dated 1980), occurring approximately 18 km from the Growth Areas. The species will not be affected by development under the Plan.
Hirundapus caudacutus	White-throated Needletail	Vulnerable, marine, migratory	2	*Hirundapus caudacutus* (White-throated Needletail) is a large swift with a breeding distribution in Asia and a non-breeding distribution in Australasia, primarily in Australia (DAWE, 2021b). In Australia, the species is widespread in eastern and south-eastern Australia. The swift is mostly aerial, generally recorded above wooded areas. Roosting occurs in trees among dense foliage in the canopy or in hollows. Its diet consists of a wide variety of insects, including beetles, cicadas, flying ants, bees, wasps, flies, termites, moths, locusts, and grasshoppers. The global and national population has not been estimated. Threats to the species include collision with wind turbines, overhead wires, windows, and lighthouses. Habitat loss, particularly in roosting or foraging areas, may lead to population decline (TSSC, 2019b).

Scientific name	Common name	Listing status	Category	Justification
				This species is primarily an aerial species and is unlikely to utilise habitat within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. There are 107 records of the species scattered across the Study Area. The Growth Areas and surrounds are likely to represent more marginal foraging habitat for the species. Development under the Plan is unlikely to affect the species or contribute to any recognised threats.
Lathamus discolor	Swift Parrot	Critically Endangered, marine	2	*Lathamus discolor* (Swift Parrot) is endemic to south-eastern Australia. The species breeds in Tasmania during the summer and migrates to mainland Australia during the winter. During the non-breeding season, foraging occurs in inland box-ironbark and grassy woodlands, and coastal swamp mahogany and spotted gum woodland or, alternatively, in coastal forest from eastern Victoria to the central coast of NSW. In Victoria, the species is primarily found in the dry forest and woodlands of the box-ironbark region on the inland slopes of the Great Dividing Range. The total population is less than 2,000 individuals. Threats to the species include land clearing. In urban areas, the bird is susceptible to mortality due to collision with wire netting, mesh fences, windows, and cars (TSSC, 2016l). The species has not been recorded within the Strategic Assessment Area. Further, suitable habitat for the species is not present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. There are 215 records of the species scattered across the Study Area, with a number concentrated on the limited areas of remnant woodland located some distance from the Growth Areas. The Growth Areas and surrounds provide very limited foraging habitat. Development under the Plan is unlikely to affect the species or contribute to any recognised threats.
Limnodromus semipalmatus	Asian Dowitcher	Vulnerable, Migratory	2	*Limnodromus semipalmatus* (Asian Dowitcher) is a large, distinctive shorebird which breeds in Siberia, Mongolia and north-east China, and visits a large range of countries in the non-breeding season. In Australia, the Asian Dowitcher is regularly visits coastal areas between Port Headland and Broome. Its occurrence is sporadic and rare elsewhere in Australia. It typically only occurs on the north and east coastline. The species feeds on inter-tidal mudflats, and roosts in sheltered coastal environments such as lagoons, creeks and mudflats. The global population was estimated to be 14,000 individuals in 2016. It is thought that 700 individuals visit Australia (DCCEEW, 2024a). Threats to the species include habitat loss and degradation caused by development, industrial aquaculture, and large dams, along with climate change, invasive species, hunting, fishing bycatch, and pollution (DCCEEW, 2024a).

Scientific name	Common name	Listing status	Category	Justification
				There are two records of the Asian Dowitcher in the Study Area, associated with coastal habitat of Port Phillip Bay. The species will not be affected by development under the Plan.
Limosa lapponica baueri	Western Alaskan Bar-tailed Godwit	Endangered	1	*Limosa lapponica baueri* (Western Alaskan Bar-tailed Godwit) breeds in the Northern Hemisphere then migrates south. In Australia, it mainly occurs along the north and east coasts. In Australia, the subspecies typically forages in tidal estuaries and harbours. Roosting occurs on banks, sandflats and spits, and sometimes in estuaries, mudflats coastal lagoons and bays (DCCEEW, 2024g). The global population of *Limosa lapponica* (at a species level) has been estimated to be between 1,099,000 – 1,149,000 individuals (Birdlife International, 2025). The Australian population was estimated to be 41,500 individuals in 2020 (DCCEEW, 2024g). In Australia, the species is threatened by ongoing human disturbance, habitat loss and degradation from development, industrial aquaculture, and invasive species, along with climate change, hunting and pollution (DCCEEW, 2024g). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 209 records of the species within the Study Area. Records are located along the shoreline of Port Phillip and in associated with the Lake Connewarre Complex. The Western Alaskan Bar-tailed Godwit is identified as part of the Ramsar listing criteria for the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site (DELWP, 2020). Potential indirect impacts to the species as a result of development may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Western Alaskan Bar-tailed Godwit.
Limosa limosa	Black-tailed Godwit	Endangered	1	*Limosa limosa* (Black-tailed Godwit) is a migratory shorebird which breeds from Iceland to far east Russia and spends the non-breeding season in parts of Europe, Africa, Australasia, and the Middle East. In Australia, Black-tailed Godwits occur in all states. Coastal areas are associated with higher numbers of the species, with the largest populations occurring between Weipa and Darwin. It is found in small numbers elsewhere. Foraging occurs on intertidal mudflats, sandflats, saltmarshes and beaches. Roosting occurs in estuaries, sheltered bays and lagoons associated with large, intertidal mudflats or sandflats (DCCEEW, 2024h).

Scientific name	Common name	Listing status	Category	Justification
				In 2016, the global population was estimated to be 614,000 – 809,000 individuals (Birdlife International, 2025). The Australian population was estimated to be 42,900 individuals in 2020 (DCCEEW, 2024h). Threats to the species include habitat loss and degradation caused by development, industrial aquaculture, large scale agriculture, and large dams, along with sea level rise associated with climate change, invasive species, exploitation and pollution (DCCEEW, 2024h). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 547 records of Black-tailed Godwit within the broader Study Area. Most of these records occur along the northern coastline of Port Phillip Bay, adjacent to The Spit Wildlife Reserve. There are 54 records associated with the Lake Connewarre Complex. Potential indirect impacts to the species as a result of development may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Black-tailed Godwit.
Macronectes giganteus	Southern Giant-Petrel	Endangered, marine, migratory	2	*Macronectes giganteus* (Southern Giant-Petrel) is a marine bird with a widespread distribution throughout the Southern Ocean. The species is often found in both pelagic and inshore waters. Breeding occurs on the Antarctic Continent, Antarctic Peninsula and islands, on subantarctic islands and in South America. Nesting occurs in exposed areas of open vegetation. The bird is both an opportunist scavenger and predator. Its diet consists of live birds, penguin carcasses, seal and whale carrion, cephalopods, euphausiids, and other crustaceans. The global population is estimated at 62,000 individuals, with a trend of rapid decline. In Australian jurisdictions, the population was estimated at 7090 breeding pairs as of 2001 (note breeding occurs on islands under Australian jurisdiction). Threats to the species include mortality due to longline fishing and trawling, and disturbance of breeding sites (DCCEEW, 2022a). There are 27 historical records of the species within the near coastal areas of the Study Area (observed between 1958 – 1988). The species will not be affected by development under the Plan.
Macronectes halli	Northern Giant Petrel	Vulnerable, marine, migratory	2	*Macronectes halli* (Northern Giant-Petrel) is a marine bird distributed across the Antarctic Polar Front. In Australia, the species is commonly found in offshore and inshore waters from Fremantle, WA to Sydney, NSW. The bird primarily occurs in sub-Antarctic and Antarctic waters. Breeding occurs on sub-Antarctic islands. Its diet consists of seal, whale,

Scientific name	Common name	Listing status	Category	Justification
				penguin carrion, seal placentae, birds, cephalopods, fish, euphausiids, and other crustaceans. The global breeding population is likely 10,700 pairs. In Australian jurisdictions, approximately 1,500 pairs breed at Macquarie Island. Estimates suggest the global population may be increasing, although there is a lack of comprehensive survey data. Threats to the species include mortality related to longline fishing, trawling, and disturbance of breeding sites (DCCEEW, 2022a). There are 10 records of the species within the near coastal areas of the Study Area. The species will not be affected by development under the Plan.
Melanodryas cucullata cucullata	South-eastern Hooded Robin	Vulnerable	2	*Melanodryas cucullata cucullata* (Hooded Robin) is a large Robin. Males are marked strikingly in black and white. Hooded Robins occur from south-east Queensland to South Australia. Hooded Robins are largely sedentary and shy. In Victoria, the species is mostly distributed across the Lowan Mallee, Murray Mallee, Wimmera, Goldfields, Central Victorian Uplands, Victorian Riverina, Northern Inland Slopes and East Gippsland Upland bioregions. The highest density of records in Victoria occur in the semi-arid region of north west Victoria (SWIFFT, 2022c). They occur in dry acacia and eucalypt woodlands and shrublands, and avoid woodlands with tall trees or dense tree cover. Nesting occurs in the crevice or fork of a tree. Habitat critical to the survival of the species is described to include areas of: dry eucalypt and acacia woodlands and shrublands remnants with an open understorey; structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses, some grassy areas and a complex ground layer, often in or near clearings or open areas; standing dead or live trees and tree stumps are also essential for nesting, roosting and foraging, and moderately deep to deep soils, rocks and fallen timber which provides essential foraging habitat. They can occur in patches as small as 2.9 ha. In more agricultural landscapes, they prefer patches larger than 10 ha. The population of the Hooded Robin was estimated to be 68,000 in 2021 (DCCEEW, 2023a). Threats to the species include habitat loss and degradation caused by land clearing for agriculture, livestock grazing, invasive weeds (the species has been found to avoid foraging in sites dominated by weeds and exotic grasses), and firewood collection, along with climate change, competition with noisy miners, inappropriate fire regimes, cat and fox predation, and habitat degradation from rabbit and deer grazing (SWIFFT, 2022d; DCCEEW, 2023a). The Plan will not result in direct impacts to suitable habitat for this species within the Growth Areas, as the Growth Areas support grassland and open agricultural environments

Scientific name	Common name	Listing status	Category	Justification
				with high densities of weeds, which are not consistent with habitat requirements of the species. There are multiple records within the VBA database of the South-eastern Hooded Robin within the Study Area. Records are concentrated on the limited areas of remnant woodland located some distance from the Growth Areas which are unlikely to be impacted under the Plan. Other than these woodland remnants, the Study Area provides very limited suitable habitat for the species. Development under the Plan is unlikely to affect the species or contribute to any recognised threats.
Neophema chrysogaster	Orange-bellied Parrot	Critically Endangered, Marine	1	*Neophema chrysogaster* (Orange-bellied Parrot) is endemic to south-eastern Australia. The species migrates between distinct breeding and non-breeding ranges. Breeding occurs in south-west Tasmania and overwintering occurs on the south-east coast of mainland Australia. Non-breeding birds are found along the coast of Victoria and South Australia, and occasionally in NSW(although sightings in NSW are now very rare) (DELWP, 2016). During the non-breeding season, the species forages in low shrubs or prostrate vegetation 10 km of the coast. When migrating, the Orange-bellied Parrot is found in locations associated with saltmarshes and adjacent pastures that are close to free-standing water bodes. It is likely that the species requires a range of winter feeding locations in different catchments, at different elevations and with a variety of food plant species to sustain them throughout winter. Roosting occurs in dense shrubs within a few kilometres of foraging sites (DELWP, 2016). Until 1920 the Orange-bellied Parrot was reported as common or locally abundant. The species has experienced a significant reduction in abundance since that time (TSSC, 2006). 70 adult Orange-bellied Parrots were recorded returning to breeding grounds in Melaleuca (in Tasmania) at the beginning of the 2021/22 breeding season. As of May 2022, there are over 500 Orange-bellied Parrots in captivity (Birdlife Australia, 2022). Threats to the species include degradation and loss of habitat, loss of genetic diversity and inbreeding, disease, stochastic environmental events, climate change, predators and competitors, barriers to migration, consumption of toxic food and plants, hybridisation with Blue-winged Parrots, and negative effects of management activities (DELWP, 2016). There are no records or potential habitat for the species within the Strategic Assessment Area. Direct impacts are considered to be unlikely. There are 1,076 records of the species within the Study Area (the most recent observed in 2023), the closest of which occurs approximately 4.5 km away from the Growth Areas. A

Scientific name	Common name	Listing status	Category	Justification
				large number of records occur along the northern shoreline of Port Phillip Bay. Records also occur at the Lake Connewarre Complex. The Bellarine Peninsula at Port Phillip Bay is a commonly used over-wintering site for the species (TSSC, 2006). Further, the species is identified as part of the Ramsar listing for the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar site (DELWP, 2020). Further detailed assessment is required to understand the potential for indirect impacts to the species associated with development under the Plan. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Orange-bellied Parrot.
Neophema chrysostoma	Blue-winged Parrot	Vulnerable	1	The Blue-winged Parrot is a partial migrant, with variable numbers of the species migrating across the Bass Strait to Tasmania in winter. Breeding has been recorded to occur on mainland Australia south of the Great Dividing Range in southern Victoria, occasionally in the far south-east of South Australia, and in a range of locations in Tasmania. During the non-breeding period, the birds are recorded from northern Victoria, eastern South Australia, south-eastern Queensland and western NSW (DCCEEW, 2023f). The species occurs in a range of habitats, including coastal, sub-coastal and inland areas. The species favours grasslands and grassy woodlands, and often occur near wetlands both near the coast and further inland. The species occurs in altered habitats, such as airfields, paddocks and golf courses, and forages mainly near or on the ground on seeds from a wide variety of native and introduced grasses, shrubs and herbs (DCCEEW, 2023f). Many aspects of the movements of the Blue-winged Parrot are poorly understood, with detailed information about migratory movements not known. It is known that, prior to migrating from Tasmania, the species congregates on saltmarshes and agricultural land prior to departing north. On the mainland, mobile flocks occur in saltmarsh and pasture in coastal Victoria (DCCEEW, 2023f). The proposed definition of habitat critical to the survival of the species includes (DCCEEW, 2023): • Foraging and staging habitats in coastal, sub-coastal and inland areas, through to semi-arid zones, including grasslands, grassy woodlands, semi-arid chenopod shrubland with native and introduced grasses, herbs and shrubs • Wetlands both near the coast and in semi-arid zones used for foraging and staging • Eucalypt forests and woodlands within the breeding range in Tasmania, coastal south-eastern South Australia and southern Victoria • Live and dead trees and stumps with suitable hollows for breeding

Scientific name	Common name	Listing status	Category	Justification
				There is uncertainty regarding the key threats which are resulting in the decline of the Blue-winged Parrot. Possible threats to the species include habitat loss, habitat degradation, weed invasion, climate change, inappropriate fire regimes, predation (by sugar gliders in Tasmania, and cats and foxes across its range), competition for tree hollows for nesting, and disease (DCCEEW, 2023f). To understand the importance of the Study Area in the context of the species' distribution, the density of species' records across its range was examined on the Atlas of Living Australia (ALA) database. The locality of the Study Area contains some of the highest densities of mainland records of the Blue-winged Parrot recorded in the ALA database. Given the region's abundant wetland environments and its proximity to the Bass Strait, it is considered likely that the migrating proportion of the species population may congregate in this locality prior to migration to Tasmania. Records of this species from the VBA database have been considered. Records are scattered throughout the Study Area. Most records occurring within the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site, including the locality of Limeburners Bay and the Lake Connewarre wetland complex, both of which are downstream from the Growth Areas. Records also occur within areas of remnant woodland and in grassland/agricultural environments in the Study Area. No records occur within the Growth Areas or the Strategic Assessment Area. Given the high density of species' records within the Study Area, the occurrence of the species within wetland habitats downstream of the Growth Areas, and the potential for the species to utilise grassland environments for foraging habitat, and the potential for the Plan to impact either directly or indirectly upon these environments, this species requires further assessment. Refer to Chapter 19 of Part 4 for the detailed impact assessment of the Blue-winged Parrot.
Numenius madagascariensis	Eastern Curlew	Critically Endangered, marine, migratory	1	*Numenius madagascariensis* (Eastern Curlew) is the largest migratory shorebird in the world. The species breeds in Mongolia, Russia and north-eastern China, and approximately 73 per cent of the population migrates to Australia in the non-breeding season. The species mostly occurs in coastal areas in Australia, foraging in sheltered intertidal sandflats and mudflats that are open and non-vegetated. They typically roost on sandy spits, sandbars and islets (DCCEEW, 2023d). In 2022, the global population was estimated to be 20,000 – 35,000 (DCCEEW, 2023d). The Australian population of the Eastern Curlew was estimated to be 22,500 in 2020 (Birdlife International, 2025).

Scientific name	Common name	Listing status	Category	Justification
				Threats to the species include ongoing human disturbance, habitat loss and degradation from development, industrial aquaculture, invasive species, and large dams, along with climate change, direct mortality from hunting, deliberate poisoning and fisheries-related mortalities, and pollution (DCCEEW, 2023d). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 217 records of the species within the Study Area scattered along the coastline of Port Phillip and associated with Lake Connewarre Complex. The species is identified as part of the Ramsar listing criteria for the Port Philip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site (DELWP, 2020). Potential indirect impacts to the species as a result of development may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Eastern Curlew.
Pachyptila turtur subantarctica	Fairy Prion	Vulnerable	2	*Pachyptila turtur subantarctica* (Fairy Prion) is a marine bird with a circumpolar distribution. During non-breeding periods, the species is found in subtropical waters. In Australia, the bird occurs along the coast from WA to QLD including Tasmania. Breeding occurs solely on Macquarie Island. The species is estimated at 250-1000 mature individuals. Threats to the species include competition with Blue Petrels, predation by invasive species, flooding, and soil erosion (TSSC, 2015b). There is one record of the species within the Strategic Assessment Area (along Cowies Creek) dated from 1981. 19 other records occur within the Study Area, most of which occur prior to 1990. Three of the 19 records occur post 1990 (two in 2017 and one in 2019). These records are located in the south of the Study Area, near Barwon Heads. There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. The species is a marine species with a wide distribution. The Study Area is unlikely to regularly support the species. The Plan is unlikely to exacerbate threats for this species, and it is considered that the species is unlikely to be affected by development under the Plan.
Pedionomus torquatus	Plains-wanderer	Critically Endangered	2	*Pedionomus torquatus* (Plains-wanderer) is a ground-dwelling bird endemic to Australia. The species is found in QLD, NSW, VIC, and SA. In Victoria, the species was historically more widely distributed, with historical records in the south, central and western parts of the

Scientific name	Common name	Listing status	Category	Justification
				state. More recently, the species is mostly recorded in north-central Victoria (DoE, 2015f, 2015e). The species inhabits sparse, treeless, lowland native grasslands, which usually occur on hard red-brown clay soils. Grassland structure is more important than floristic composition for suitable habitat, with grasslands comprising approximately 50 per cent bare ground. Nesting occurs in native grasses and herbs. Its diet consists of a mixture of seeds, invertebrates, and leaves (DoE, 2015f, 2015e). The population is estimated to vary between 5,500 - 7,000 to around 2,000 birds. There has been a decline in the Victorian Stronghold by >90% (BirdLife International, 2022a). Threats to the species include habitat loss and fragmentation from agricultural expansion, inappropriate grazing regimes and inappropriate habitat management (DoE, 2015f, 2015e). The species has not been recorded within the Strategic Assessment Area. Further, suitable habitat is not present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. There are nine records of the species within the Study Area, with only one being contemporary (from 2013), and located over 15 km from the Growth Areas. The Study Area is unlikely to regularly support the species, given that the species mainly occurs in northern-central Victoria. The species is unlikely to be affected by development under the Plan.
Phoebetria fusca	Sooty Albatross	Vulnerable, marine, migratory	2	*Phoebetria fusca* (Sooty Albatross) is pelagic species distributed in the South Atlantic and southern Indian Oceans. The species inhabits subantarctic and subtropical marine waters. Breeding generally occurs on small, isolated, and subantarctic islands. Its diet consists of fish, crustaceans, offal, and cephalopods. The global population was estimated to be 100,000 individuals, with 15,700 breeding pairs in 1998. Threats to the species include drowning in longline fishing gear, hook and plastic ingestion, collisions with fishing trawlers, disease, and breeding failures (DCCEEW, 2022b). The species has not been recorded within the Study Area and will not be affected by development under the Plan.
Pluvialis squatarola	Grey Plover	Vulnerable	2	*Pluvialis squatarola* (Grey Plover) is a medium sized plover with large dark eyes and a large head. The species breeds in Alaska, northern Siberia and northern Canada, and spends the non-breeding season in parts of Asia, Africa, Europe and Australasia. The species has been recorded in all states of Australia, though is primarily found along the south and west coasts. The largest populations are found between South Australia and the coast of Western Australia in the northern Kimberley. They forage in intertidal mudflats, sandflats,

Scientific name	Common name	Listing status	Category	Justification
				saltmarshes, bays and estuaries. Roosting occurs in sandy areas in sheltered environments including lagoons, estuaries and beaches (DCCEEW, 2024j). The global population is estimated to be between 1,00,000 to 2,500,000 mature individuals (Birdlife International, 2025). The Australian population was estimated to be 11,300 mature individuals in 2020 (DCCEEW, 2024j). Threats to the species include habitat loss and degradation caused by development, industrial aquaculture, invasive species, and large dams, along with anthropogenic disturbance, climate change, hunting, fisheries-related mortalities and pollution (DCCEEW, 2024j). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 66 records of the species within the Study Area Records are primarily located between Avalon beach and The Spit. These areas are not hydrologically connected to the Growth Areas and will not be indirectly impacted by development under the Plan. Overall, the species is unlikely to be affected by development under the Plan.
Polytelis swainsonii	Superb Parrot	Vulnerable	2	*Polytelis swainsonii* (Superb Parrot) is a medium sized, green parrot with a long tail. The core range is west of the Great Dividing Range in NSW from Canberra, Goulburn and as far west as Nyngan and Swan Hill. Within Victoria the species is mostly confined to Barmah forest, with sightings south to Shepparton and east to Wangaratta and Corryong. The species nests in large, living or dead trees with hollow branches, and typically near a watercourse. The species uses at least six species of eucalyptus, though has a particular reliance on *Eucalyptus blakelyi* (Blakely's Red Gum). The species mostly feeds on the ground on a variety of native and introduced seeds. The population was estimated at 6,500 mature birds in 2000. Major threats to the species include loss and degradation of habitat, competition for nest hollows, road kills, illegal removal of wild birds, disease, and climate change (TSSC, 2016i). The species has not been recorded within the Strategic Assessment Area. Further, suitable habitat for the species is not present within the Strategic Assessment Area. Direct impacts are therefore considered unlikely. There is one record of the species within the Study Area (dated 1999, with an accuracy of 10 km), which occurs approximately 17.1 km from the Growth Areas near Little River. The Study Area is generally unsuitable for the species. Development under the Plan is unlikely to affect the Superb Parrot.

Scientific name	Common name	Listing status	Category	Justification
Rostratula australis	Australian Painted Snipe	Endangered, marine	1	*Rostratula australis* (Australian Painted Snipe) is a wading bird that is only found in Australia and mainly occurs in the Murray Darling Basin. It is widespread across Australia (DSEWPaC, 2013b; DCCEEW, 2022b). Relatively little is known about the ecology of this species, as it has few records, unpredictable movements, cryptic habits, and often occurs in reasonably inaccessible areas (DoEE, 2019). The species inhabits ephemeral and permanent shallow freshwater wetlands, and occasionally in brackish wetlands. It favours a dense cover of grass and reeds (DSEWPaC, 2013b). The species breeds all year round depending on available suitable wetland conditions (DCCEEW, 2022b). Breeding habitat requirements may be quite specific (DoEE, 2019). There are a number of population estimates for the species, ranging between 1,500 and 5,000 mature individuals. Population estimates are considered unreliable due to the species' cryptic nature, inaccessible habitat and limited numbers of surveys (DoEE, 2019). The species Conservation Advice (DSEWPaC, 2013b) and draft Recovery Plan (DoEE, 2019) have identified the following threats: loss and degradation of wetlands, inappropriate hydrological regimes, declines in water quality, grazing and trampling of wetlands by livestock, climate change, invasive flora and fauna, human disturbance, inappropriate fire regimes, and low genetic diversity. There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 15 records of the species within the Study Area, several records downstream of development associated with the Lake Connewarre Complex. Potential indirect impacts to the species may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Australian Painted Snipe.
Stagonopleura guttata	Diamond Firetail	Vulnerable	2	Diamond Firetails occur in south-east mainland Australia, from south-east Queensland to South Australia, and about 300 km inland from the coast. The species used to occur further north in Queensland but currently only occurs in the southernmost parts of the State. It has disappeared from many of the more settled regions of NSW, ACT and Victoria, and currently occurs as disjunct populations in South Australia (DCCEEW, 2023e). The species occupies eucalypt, acacia or casuarina woodlands, open forests, and lightly timbered habitats with scattered trees. The species is likely to be sedentary, although may move locally. Nesting occurs in dense shrubs. Habitat critical to the survival of the species is

Scientific name	Common name	Listing status	Category	Justification
				proposed to include areas of eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats; areas with low tree density, few large logs and little litter cover but high grass cover for foraging, roosting and breeding, and Drooping She-oak habitat within the Mt Lofty Ranges (DCCEEW, 2023e). Threats to the species include habitat loss caused by large scale land clearing for agriculture, weeds (particularly exotic grasses which alter habitat values), habitat degradation caused by livestock, rabbit, and overabundant kangaroo grazing, inappropriate fire regimes, climate change, competition with noisy miners, and predation by Pied Currawongs (DCCEEW, 2023e). The Plan will not result in direct impacts to suitable habitat for this species within the Growth Areas, as the Growth Areas support grassland and open agricultural environments which are heavily infested with exotic grass species, which are not consistent with habitat requirements of the species. There are multiple records within the VBA database of the Diamond Firetail within the Study Area. Records are concentrated on the limited areas of remnant woodland located some distance from the Growth Areas which are unlikely to be impacted under the Plan. Other than these woodland remnants, the Study Area provides very limited suitable habitat for the species. Development under the Plan is unlikely to affect the species or contribute to any recognised threats.
Sternula albifrons	Little Tern	Vulnerable, migratory	1	While the Little Tern is a species which has a large global distribution and population size, the Australian population is geographically distinct. Its occurrence in Australia can be divided into three groups: • A sub-population that occurs in south-eastern Australia and New Zealand. It breeds in multiple areas in Australia, including Tasmania, South Australia, Victoria, NSW, and in Queensland (DCCEEW, 2025). This sub-population may be at risk from the Plan • A sub-population that breeds in northern Australia between Cape York and Broome (DCCEEW, 2025). This sub-population is not at risk from the Plan • A sub-population that breeds in north-east Asia and migrates to northern and eastern Australia during the non-breeding season. It is recognised that most threats to the species are associated with breeding, and therefore that the sub-population of non-breeding visitors is unlikely to be at risk (DCCEEW, 2025). This sub-population is not at risk from the Plan

Scientific name	Common name	Listing status	Category	Justification
				For the purpose of this assessment, only the south-eastern sub-population of the species is considered. Threats to the species include human disturbance at nesting sites, industrial and urban development, altered hydrological regimes, beach wrack harvesting, invasive weeds, predation by invasive and native species, climate change impacts, and hybridisation with Fairy Terns (DCCEEW, 2025). The estimated population size of the south-eastern sub-population is 1,200 mature individuals (DCCEEW, 2025). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 681 post 1990 records of Little Tern within the Study Area. Most of these records occur along the northern coastline of Port Phillip Bay, extending from Avalon Beach in the west to the boundary of the Study Area in the east. A number of records are also associated with Moolap, and Lake Connewarre. Potential indirect impacts to the species may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Little Tern.
Sternula nereis nereis	Australian Fairy Tern	Vulnerable	1	*Sternula nereis nereis* (Australian Fairy Tern) is the Australian subspecies of the Fairy Tern. It occurs along the coasts of southern Australia from the Montebello Islands of the Pilbara in Western Australia to Botany Bay NSW, with a gap in distribution across the Great Australian Bight (DAWE, 2020). The Australian Fairy Tern uses a variety of habitats including offshore, estuarine or lacustrine (lake) islands, coastal wetlands, beaches and sand spits. Nesting habitat consists of a shallow scrape in the sand which may be lined with vegetation or small shells. In Victoria, the species uses seagrass covered beaches for nesting (DAWE, 2020). The species extent of occurrence is approximately 380,000 km^2 and the area of occupancy is estimated to be 1,150 km^2 (DSEWPaC, 2011a). The population of the Australian Fairy Tern is estimated at 7,450, of which approximately 100 – 150 occur in Victoria. The number of nesting colonies has declined, particularly around the Victorian coastline. There have been few records documenting successful breeding attempts over the last decade within Western Port Ramsar site and Port Phillip

Scientific name	Common name	Listing status	Category	Justification
				Bay. Gippsland Lakes Ramsar site continues to host breeding Australian Fairy Terns (DAWE, 2020). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 1,096 records of the Australian Fairy Tern within the Study Area concentrated along the Port Phillip coastline and the Lake Connewarre Complex. The species is identified as part of the Ramsar listing criteria for the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site. The Ramsar site is also known to regularly support over 1 per cent of the total population of the Australian Fairy Tern (DELWP, 2020). Potential indirect impacts to the species may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Australian Painted Snipe.
Thalassarche carteri	Indian Yellow-nosed Albatross	Vulnerable, marine, migratory	2	*Thalassarche carteri* (Indian Yellow-nosed Albatross) is a marine bird that occurs in the southern Indian Ocean. In Australia, the species occurs primarily along the coast in WA, located in subtropical and warmer subantarctic waters. Breeding occurs on islands of the southern Indian Ocean. Its diet primarily consists of cephalopods and fish. The current global population is estimated at 160,000 - 180,000 individuals, with 36,500 breeding pairs. Threats to the species include drowning in longline fishing gear, and collision with cables and warps (DCCEEW, 2022b). There are a small number of historical records from 1979 within the near coastal areas of the Study Area. The species will not be affected by development under the Plan.
Thalassarche cauta	Shy Albatross	Endangered, marine, migratory	2	*Thalassarche cauta* (Shy Albatross) is the only albatross species endemic to Australia. The species predominantly occurs in waters adjacent to Tasmania and SA with breeding colonies on three small islands off of Tasmania. The pelagic bird inhabits sub-Antarctic and subtropical marine waters and is occasionally found in continental shelf waters, bays, and harbours. Its diet primarily consists of cephalopods and fish, followed by tunicates and crustaceans. The total population was estimated at about 30,000 individuals in 2017-2018 (DCCEEW, 2022b). Threats to the species include fishing activities, climate change, disease, interspecies competition, marine pollution, human disturbance, and harvesting from the wild (TSSC, 2020a). There are a number of records associated with coastal areas in the south of the Study Area. The species will not be affected by development under the Plan.

Scientific name	Common name	Listing status	Category	Justification
Thalassarche impavida	Campbell Albatross	Vulnerable, marine, migratory	2	*Thalassarche impavida* (Campbell Albatross) is a marine bird that occurs in Antarctic, sub-Antarctic waters, and sub-tropical South Pacific Ocean. In Australia, the bird is often found foraging over the oceanic continental slopes off TAS, VIC, and NSW. The species does not breed in Australia. In both breeding and non-breeding periods, the albatross is a specialised shelf feeder and scavenger with a diet of krill and fish and occasionally cephalopods, salps, and jellyfish. The global population was estimated at 19,000 - 26,000 breeding pairs on Campbell Island. Threats to the species include drowning in longline fishing gear, and collision with cables and warps used on fishing trawlers (DCCEEW, 2022b). The species has not been recorded within the Study Area and will not be affected by development under the Plan.
Thalassarche melanophris	Black-browed Albatross	Vulnerable, marine, migratory	2	*Thalassarche melanophris* (Black-browed Albatross) is a marine bird with a circumpolar distribution in Antarctic, sub-Antarctic, and temperate waters and occasionally tropical waters. Breeding occurs on sub-Antarctic and peri-Antarctic islands and, in Australia, on four geographically isolated locations. Its diet primarily consists of a combination of fish, molluscs (mostly cephalopods), and crustaceans (mostly krill) and occasionally carrion, jellyfish, and salps. During the non-breeding period, the species is found at the continental shelf and shelf-break of SA, VIC, TAS, and NSW. The global population is estimated between 1,000,000 and 2,500,000 birds. It is estimated that less than 1% of this population breeds within Australian jurisdiction. Threats to the species include longline fishing, trawl fishing, dependency on fishery discards, parasites and associated disease, incidental mortality with coastal fisheries, reduced food stocks, reduced breeding success, and erosion of colony sites by European Rabbits (DAWE, 2005). There are a number of records associated with coastal areas in the south of the Study Area. The species will not be affected by development under the Plan.
Thalassarche salvini	Salvin's Albatross	Vulnerable, marine, migratory	2	The Salvin's Albatross is a marine bird found in sub-Antarctic and sub-tropical waters. In Australian waters, the bird is distributed off the coast of QLD, NSW, VIC, SA, and TAS. The species does not breed in Australia. Its diet primarily consists of inshore cephalopods and fish, feeding primarily in shelf waters. The global population is estimated between 350,000 and 380,000 individuals. Threats to the species include incidental catch during longline fishing operations, loss of food stock, ingestion or being caught in oil spills, marine debris, and pollution, and commercial fishing (DCCEEW, 2022b). The species has not been recorded within the Study Area and will not be affected by development under the Plan.

Scientific name	Common name	Listing status	Category	Justification
Thalassarche steadi	White-capped Albatross	Vulnerable, marine, migratory	2	*Thalassarche steadi* (White-capped Albatross) is a marine bird found in sub-Antarctic and sub-tropical waters. In Australian waters, the bird is distributed off the coast of south-east Australia. The species does not breed in Australia. Its diet likely consists of inshore cephalopods and fish; however, this has not been confirmed. The global population was estimated at 70,000 - 85,000 breeding pairs in 2003, though other estimates place the global population as high as 150,000 - 375,000. Threats to the species include pig predation at nests, mortality due to longline fishing gear, collision with trawl warps, reduced food stock, ingestion or being caught in marine debris, oil spills, pollution, and commercial fishing (DCCEEW, 2022b). The species has not been recorded within the Study Area and will not be affected by development under the Plan.
Thinornis cucullatus cucullatus	Eastern Hooded Plover	Vulnerable, Marine	2	*Thinornis cucullatus cucullatus* (Eastern Hooded Plover) is a wading bird endemic to southern Australia, distributed in coastal areas from Jervis Bay to Fowlers Bay and Tasmania along with offshore islands such as Kangaroo Island and King Island. Important stretches of coast for the species in Victoria include Warrnambool to Portland, the Mornington Peninsula, and Bass Coast. The Eastern Hooded Plover occurs on or near sandy beaches. The species forages on the beach, including on the water edge, the base of fore-dunes, and on lagoons and saltpans. The majority of birds (95 per cent) move over distances less than 20 km, and the species has breeding territories of ~37 ha, displaying high site fidelity. In Victoria, the species occurs in low densities with an estimated 570 individuals. Threats to the species include the crushing of eggs, chicks and nesting birds by human activity including domestic dogs, predation by invasive species, oil spills and marine debris, infrastructure near to or on beaches, extreme weather events, and future threats from sea level rise (DoE, 2014). The Eastern Hooded Plover is a predominantly coastal species. While some records of the species occur within the Study Area, these records are primarily to the south of the Study Area, associated with the southern coastal environment. While part of the coastal area in the south of the Study Area is downstream of the Strategic Assessment Area (where the Lake Connewarre Complex discharges into the ocean), indirect impacts to this region are considered unlikely under the Plan. This is because of the distance of this environment from the Strategic Assessment Area combined with mitigation measures to control runoff from the Strategic Assessment Area It is noted that the Eastern Hooded Plover is identified as part of the Ramsar listing criteria for the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site (DELWP, 2020). However, the Ramsar site covers a large area, extending outside of the Study Area

Scientific name	Common name	Listing status	Category	Justification
				into coastal environments. It is considered more likely that habitat for the Eastern Hooded Plover would be supported by these areas of the Ramsar site outside of the Study Area.
Tringa nebularia	Common Greenshank, Greenshank	Endangered	1	*Tringa nebularia* (Common Greenshank) is a large migratory shorebird. They have an extensive breeding range in the northern hemisphere, and are widespread during the non-breeding season. Common Greenshanks over-winter in Africa, Europe, Asia, Australasia, and Melanesia. In Australia, the species is widespread in coastal regions, with the widest distribution of the shorebirds that occur in Australia. In Victoria, they are found between Port Phillip Bay and Gippsland Lakes, and west to Streaky Bay. They also occur inland, west and in the Murray River Valley. They occur in all types of wetlands in Australia, foraging at the edge of wetlands, on mudflats or in the shallows around the edge of waterbodies. They roost both inland and on the coast, in estuaries, mangrove swamps and lagoons, mudflats, billabongs, sewage farms and flooded crops (DCCEEW, 2024l). The global population was estimated to be 440,000 – 1,500,000 individuals in 2015 (Birdlife International, 2025). In 2020, the Australian population was estimated to be 23,700 individuals (DCCEEW, 2024l). Threats to the species include habitat loss and degradation caused by development, industrial aquaculture, and large dams, along with anthropogenic disturbance, climate change, invasive species, hunting, fishing bycatch, and pollution (DCCEEW, 2024l). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 2,447 records of Common Greenshank within the Study Area. Records are concentrated around Point Wilson, Avalon Beach, Point Henry, and the Lake Connewarre Complex. Potential indirect impacts to the species may be possible, predominantly related to potential downstream impacts from changes to hydrology. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Common Greenshank.
Xenus cinereus	Terek Sandpiper	Vulnerable	2	*Xenus cinereus* (Terek Sandpiper) is a migratory shorebird which breeds in northern Russia. During the non-breeding season, the species migrates to Africa, Asia, New Guinea, Australia and New Zealand. In Australia, the species is mostly coastal, though occasionally recorded inland. Terek Sandpipers are more common in eastern and northern Australia than southern Australia. In Victoria, the species has been recorded from Westernport Bay, Anderson Inlet, Corner inlet, and west Port Phillip Bay. They occur on sheltered coastal mudflats, roosting amongst dead trees or mangroves. They also use sandflats, estuaries,

Scientific name	Common name	Listing status	Category	Justification
				sandy beaches, coral reefs, and mudflats or sandbars at the mouths of river (DCCEEW, 2024m). The global population was estimated to be 160,000 to 1,200,000 individuals in 2015 (Birdlife International, 2025). In 2020, the Australian population was estimated to be 16,000 mature individuals (DCCEEW, 2024m). Threats to the species include habitat loss caused by development, industrial aquaculture and large dams, anthropogenic disturbance, climate change, exploitation, pollution, and invasive species (DCCEEW, 2024m). There are no records or potential habitat for the species within the Growth Areas and the likelihood of the species relying on the Strategic Assessment Area for any key stages of its life cycle is considered to be very low. Direct impacts are considered to be unlikely. There are 159 records of Terek Sandpiper within the Study Area. Records are mostly associated with the shoreline of Port Phillip Bay, particularly around the Spit and Point Henry. These areas will not be impacted by the Plan as they are not located downstream of the Strategic Assessment Area. There are limited isolated records of the species downstream of the Growth Areas, associated with the Lake Connewarre Complex. Given that the species is associated with coastal habitats which will not be impacted by the Plan, potential indirect impacts are considered unlikely.
Reptiles				
Caretta caretta	Loggerhead Turtle	Endangered, marine, migratory	2	*Caretta caretta* (Loggerhead Turtle) is a marine turtle occurring in Australian waters. Marine turtles are migratory and depend upon dispersed habitats (both marine and terrestrial) throughout their life cycle. There are two distinct stocks of Loggerhead Turtles that nest in Australia, one in Queensland, and one in Western Australia. The species forages in all coastal states, though is considered uncommon in South Australia, Victoria and Tasmania (DoEE, 2017a). In 2003, it was estimated that there are 500 nesting females per year in Eastern Australia (DCCEEW, 2022a). Threats to marine turtles in Australia include climate change, marine debris, chemical and terrestrial discharge, international take, terrestrial predation, bycatch, light pollution, habitat modification, indigenous take, vessel disturbance, noise interference, recreational activities and diseases and pathogens (DoEE, 2017a). There are no records of the species within the marine environment of the Study Area. The species will not be affected by development under the Plan.
Delma impar	Striped Legless Lizard	Vulnerable	1	*Delma impar* (Striped Legless Lizard) is a small reptile with very reduced hind limbs and lacking forelimbs. It has considerable colour variation, with a pale grey-brown dorsal and

Scientific name	Common name	Listing status	Category	Justification
				cream ventral, and dark brown or black stripes along the length of the tail and body (TSSC, 2016d). The species was formerly distributed through temperate lowland grasslands in the ACT, south-western and southern NSW, central and southern Victoria, and south-east SA. Its distribution has declined. Within Victoria, the range of the species appears to have contracted to the southern part of the state (DCCEEW, 2022a). The species is a grassland specialist and is found only in native grassland and nearby grassy woodlands and exotic pasture. Occupied sites have grassy groundcover, a mixture of native and exotic perennial and annual species, and annual tussock-forming grasses. There is a higher probability of encountering the species in sites with high structural complexity (Howland et al., 2016; TSSC, 2016e; DCCEEW, 2022a). The total number of individuals is unknown. As of 2014, the species' population was thought to be in excess of 1,000 individuals (DCCEEW, 2022a). There are four distinct genetic lineages: South Australia & Victorian Wimmera; south-western Victoria (including Melbourne and Geelong); eastern Victoria; and a lineage covering the ACT and Monaro Plains in NSW. These lineages have a high level of genetic divergence and should be considered as separate Evolutionarily Significant Units (TSSC, 2016d). Threats to the species include the loss, modification, degradation and fragmentation of habitat, invasive species, and inappropriate fire regimes (TSSC, 2016d). The species has been recorded within the NGGA. Further detailed assessment is needed to understand the potential for direct, indirect and cumulative impacts. Refer to Section 19.3 of Part 4 for the detailed impact assessment of the Striped Legless Lizard.
Dermochelys coriacea	Leatherback Turtle	Endangered, marine, migratory	2	*Dermochelys coriacea* (Leatherback Turtle) is a marine turtle occurring in Australian waters. Marine turtles are migratory and depend upon dispersed habitats (both marine and terrestrial) throughout their life cycle. The leatherback turtle spends most of its life in the open ocean, and forages on plankton and jellyfish in the water column. The species is commonly found foraging along the east coast and bass strait, and the southern waters of Australia are one of five identified foraging sites for Leatherback Turtles. Threats to marine turtles in Australia include climate change, marine debris, chemical and terrestrial discharge, international take, terrestrial predation, bycatch, light pollution, habitat modification, indigenous take, vessel disturbance, noise interference, recreational activities and diseases and pathogens (DoEE, 2017a). Australia is not known as a major nesting area for the species. However, nesting may occur on the Cobourg Peninsula, in Western Australia, and previously in Queensland and in

Scientific name	Common name	Listing status	Category	Justification
				northern NSW near Ballina (although there have been no records of nesting in QLD and NSW since 1996) (DoEE, 2017a). There are two records within the Study Area, approximately 7 km to the east of the Growth Areas within the marine environment. The species is a marine species with a global tropical and temperate distribution and will not be affected by development under the Plan.
Lepidochelys olivacea	Pacific (Olive) Ridley	Endangered	2	*Lepidochelys olivacea* (Olive Ridley Turtle) is a marine turtle occurring in Australian waters. Marine turtles are migratory and depend upon dispersed habitats (both marine and terrestrial) throughout their life cycle. There are two stocks of Olive Ridley Turtles in Australia, one which nests in the Northern Territory and one which nests on western Cape York. While there is limited understanding of the species' dispersal, it is believed to remain on the Australian continental shelf into waters near Indonesia. Mapped habitat for the species occurs in northern Australia, and there is no mapped habitat for the species along the Victorian coast. Threats to marine turtles in Australia include climate change, marine debris, chemical and terrestrial discharge, international take, terrestrial predation, bycatch, light pollution, habitat modification, indigenous take, vessel disturbance, noise interference, recreational activities and diseases and pathogens (DoEE, 2017a). There is one record (from 1974) within the Study Area, approximately 15 km to the east of the Growth Areas within the marine environment. The validity of the record is questionable given its age and the fact that Victoria is outside the usual range of the species. The species will not be affected by development under the Plan.
Tympanocryptis pinguicolla	Victorian Grassland Earless Dragon	Endangered	1	*Tympanocryptis pinguicolla* (Victorian Grassland Earless Dragon) is a small lizard occurring in Victoria. The species had previously been grouped with grassland earless dragons from the ACT and NSW. There are now four distinct species recognised including the Victorian Grassland Earless Dragon (DCCEEW, 2023i). Grassland Earless Dragons occur in native tussock grasslands with little to no trees or shrubs (DCCEEW, 2023k). Most historical records of VGED are from the Victorian volcanic grasslands of the Keilor Plains. Several historic records are from areas with coastal alluvial soils in the Melbourne City area, suggesting that VGED may occur in coastal grasslands that adjoin saline habitats (DCCEEW, 2023i). Threats to the species include urban development, agricultural activities, grassland management, overgrazing of grasslands, weed invasion, too frequent, hot or out of season fires, prolonged drought, climate change, and predation by cats, foxes, snakes and birds (DCCEEW, 2023i, 2023k). Victorian Grassland Earless Dragon was presumed extinct until its rediscovery in January 2023. The current distribution is unknown (DCCEEW, 2023i). Victorian Grassland Earless

Scientific name	Common name	Listing status	Category	Justification
				Dragon is currently known from one site west of Melbourne where the species was rediscovered (Zoos Victoria, 2024). There are four historical records of Victorian Grassland Earless Dragon within the Study Area, in the Little River area. One record is dated 1967 and represents the last collected specimen of VGED prior to rediscovery. The remaining three records are dated 1990, and relate to the unvalidated sightings. Targeted surveys undertaken by Biosis in the Growth Areas undertaken during 2024 did not record the species (Biosis, 2024). However, detailed habitat assessments and analysis indicate that parts of the Growth Areas provide suitable habitat attributes for the species (Biosis, 2024; Biosis & Open Lines, 2024). Further assessment is required to understand the potential for indirect or cumulative impacts to potentially suitable habitat. Refer to Section 19.5 of Part 4 for the detailed impact assessment of the Victorian Grassland Earless Dragon.
Amphibians				
Litoria raniformis	Growling Grass Frog	Vulnerable	1	*Litoria raniformis* (Growling Grass Frog) is a large frog, olive green to bright emerald green in colour with large golden-bronze blotches (Clemann and Gillespie, 2012). The species is endemic to south-east Australia. It was historically one of the most common frogs in that region but has suffered substantial declines in abundance and range (DCCEEW, 2024i). The species occurs as two subspecies that are biogeographically and genetically distinct. These are *L. r. raniformis* (the northern lineage) and *L. r. major* (the southern lineage). The southern lineage (relevant to the Strategic Assessment Area) occurs in south-eastern NSW, eastern and southern Victoria, south-east SA, northern and eastern Tasmania and King Island. There is limited information available regarding the estimated total size of each group, or the number of discrete populations or metapopulations within each group. Growling Grass Frogs use a range of slow-flowing or still waterbodies. The species is dependent on a matrix of terrestrial and aquatic habitat, and often occurs in areas with both seasonally flooded and permanent waterbodies (DCCEEW, 2024f). The GGF Significant Impact Guidelines (DEWHA, 2009c) identify the threats most relevant to decision making under the EPBC Act. These include loss and degradation of habitat, fragmentation and isolation of populations caused by construction of barriers to movement and introduced predators and diseases. The species' Recovery Plan (Clemann and Gillespie, 2012) also identifies increased exposure of frogs to harmful levels of ultraviolet-B radiation (due to anthropogenic depletion of the ozone layer) as an additional threat. Additionally,

Scientific name	Common name	Listing status	Category	Justification
				the Conservation Advice identifies increased frequency and severity of fire, and increased severity of droughts associated with climate change as threats to GGF (DCCEEW, 2024d). The species was recorded in the WGGA during recent site surveys (EHP, 2021) and is widely recorded throughout the riparian and coastal parts of the Study Area. The species is also identified as part of the Ramsar listing criteria for the Ramsar site (DELWP, 2020). Further detailed assessment is needed to understand the potential for direct, indirect and cumulative impacts. Refer to Section 19.2 of Part 4 for the detailed impact assessment of the Growling Grass Frog.
Fish				
Carcharodon carcharias	Great White Shark	Vulnerable, migratory	2	*Carcharodon carcharias* (White Shark) is a long lived shark found in the temperate and sub-tropical regions of the southern and northern hemispheres. The species primarily occurs in continental and insular shelf waters, but also may inhabit the open ocean. The species is commonly found in the vicinity of islands and near colonies of seals. The distribution of the White Shark within Australia ranges from central Queensland, around the southern coastline, to the North West Cape in Western Australia (DSEWPaC, 2013a). The population globally and within Australia is not well known and was thought to be less than 10,000 mature individuals in 1996 (DCCEEW, 2022a). Threats to the species include mortality related to bycatch or illegal fishing, or mortality due to shark control activities. Other threats may include habitat modification, climate change, and ecotourism (DSEWPaC, 2013a). There are no records of the species within the marine environment of the Study Area. The species will not be affected by development under the Plan.
Maccullochella peelii	Murray Cod	Vulnerable	2	*Maccullochella peelii* (Murray Cod) is one of the largest freshwater fish in the world and is endemic to the Murray-Darling River system, occurring in SA, Victoria, NSW, ACT, and Queensland. The species still occurs throughout most of its historic range, although there have been some localised extinctions in upper tributaries. The species occurs in flowing and standing waters, from small clear streams to large, turbid, meandering slow-flowing rivers, creeks, lakes and billabongs. The main river channel and larger tributaries of the Murray-Darling Basin are considered important habitat, and the species is considered a 'main channel specialist' (TSSC, 2010). There is insufficient information available to confidently quantify the population size. However, the Victorian population numbers are much lower than pre-European levels (DCCEEW, 2022a). Threats include flow regulation, habitat degradation, lowered water quality, barriers, alien species, commercial fishing, recreational fishing, illegal fishing, stocking and translocations, genetic issues, diseases, and climate change (TSSC, 2010).

Scientific name	Common name	Listing status	Category	Justification
				There is one record of the species (from 1873) within the Study Area, approximately 2 km to the east of the Growth Areas. The age of the record and lack of other records indicates the species is not present. The species will not be affected by development under the Plan.
Macquaria australasica	Macquarie Perch	Endangered	2	*Macquaria australasica* (Macquarie Perch) is a moderate-sized freshwater fish reaching a length of 465 mm and a weight of 3.5 kg. Populations are found across the Murray-Darling Basin, although often small and geographically separated. In Victoria, populations are known to occur in the upper reaches of the Goulburn, Broken, Ovens and Mitta Mitta catchments. Threats to the species include competition and predation by invasive fish species, increased sedimentation, barriers to fish movement and altered flow regimes (DoE, 2013b). There are 6 records of the species within the Study Area. However, none of these are contemporary with the most recent being from 1981. These occur in the Moorabool and Barwon Rivers, noting that this is not part of the species' natural distribution. The age of the records and lack of other records indicates the species is unlikely to be present. The species is unlikely to be affected by development under the Plan.
Nannoperca obscura	Yarra Pygmy Perch	Endangered	1	*Nannoperca obscura* (Yarra Pygmy Perch) is a small olive green and yellow-white fish up to 75 mm. It occurs from the Maribyrnong River system in Victoria to the Henry Creek Catchment in South Australia. It is most common in western Victoria (DCCEEW, 2023f). The species occurs in slow-flowing or still water, which is characterised by large amounts of aquatic vegetation, including lakes, ponds and slow-flowing rivers (DCCEEW, 2023f). Within its range, the species has a patchy and highly fragmented distribution, and there has been substantial reduction in genetic diversity. Connectivity between areas of permanent waterbodies is important for long-term survival (DCCEEW, 2023f). As of 2010, the species had been recorded from 42 sites across Victoria and South Australia, of these, four were thought to be extinct (Saddlier and Hammer, 2010). In 2002, major Victorian populations were thought to occur between the Barwon River and the South-Australia border (DCCEEW, 2022b). Threats to the species include degradation and loss of habitat, alteration to flow regimes, climate change, introduced aquatic species, competition and predation, increase in fire frequency and severity and illegal collection (DCCEEW, 2023f). There are 85 records of the species (the most recent from 2022) within the Study Area. These occur in multiple locations along the Moorabool River (upstream and downstream of the Strategic Assessment Area), along the Barwon River, within Waurn Ponds Creek, within the Lake Connewarre Complex, and along Thompson Creek.

Scientific name	Common name	Listing status	Category	Justification
				It is reported that there are records of the species immediately adjacent to WGGA in the Moorabool River (EHP, 2021). However, there are no records in this locality on the VBA database. It is possible that there are records of the species in this area which have not been entered into the VBA database. There will be no development within the Moorabool River under the Plan, and as such, there is no potential for direct impacts to the species. However, potential indirect impacts to the species as a result of development may be possible. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Yarra Pygmy Perch.
Prototroctes maraena	Australian Grayling	Vulnerable	1	*Prototroctes maraena* (Australian Grayling) is a small to medium fish occurring in waterways of south-eastern Australia. Historically, it was known to occur in freshwater, estuarine and marine reaches of coastal catchments greater than 200 m above sea level in NSW, Victoria, Tasmania and South Australia. Its current distribution has declined from its historical distribution (TSSC, 2021). The Australian Grayling spends larval stages in marine water, and adult life in fresh water. The species migrates downstream in lower freshwater reaches of rivers to spawn. It is thought to be able to quickly re-populate in the correct conditions following periods of poor environmental conditions (TSSC, 2021). The species is considered to occur as a single population in Victoria. There are no reliable national population estimates for the species. Due to the species' capacity to lay large quantities of eggs, it has been suggested that the population can undergo large fluctuations (TSSC, 2021). The species Conservation Advice and Recovery Plan has identified the following threats (Backhouse, O'Conner and Jackson, 2008; TSSC, 2021): habitat loss and fragmentation (including fish passage barriers, altered hydrology and poor water quality, and changes to coastal morphology), introduced fish species, climate change, disease, and fishing. Site surveys indicated the presence of suitable habitat for the Australian Grayling within the Moorabool River within WGGA. While the species was not detected at this location during surveys, it is recognised that the species is present within the wider Moorabool River catchment (EHP, 2021). Specifically, there are 55 records of the species within the Study Area (the most recent from 1998). The majority of these records occur within the Barwon River downstream of the Growth Areas. The Corangamite Catchment Management Authority are proposing to remove barriers along the Moorabool River which currently prevent fish from accessing habitat upstream to

Scientific name	Common name	Listing status	Category	Justification
				the WGGA within the next 2 to 3 years. With the removal of these barriers, future planning within the WGGA should assume the presence of the Australian Grayling (EHP, 2021). There will be no development within the Moorabool River under the Plan, and as such, there is no potential for direct impacts to the species. However, potential indirect impacts to the species as a result of development may be possible. Further detailed assessment is required to understand potential impacts. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Australian Grayling.
Insects				
Synemon plana	Golden Sun Moth	Vulnerable	1	*Synemon plana* (Golden Sun Moth) is a day-flying moth with a wingspan of about 34 mm. The species is found in grassland habitat in south-eastern Australia, occurring from central NSW between Parkes and Bathurst, through the ACT, down to central and western Victoria and just across the border to eastern South Australia. The Extent of Occurrence and Area of Occupation are currently understood to be 145,322 km² and 1,596 km² respectively (DAWE, 2021d). The species' distribution is fragmented, and it is likely that sites separated by over 200 m are geographically isolated. As of 2021, the species is known from 164 sites, of which 104 occur in Victoria (DAWE, 2021d). Habitat for the species includes sites which contain (or have previously contained) native grassland, open grassy woodlands, and secondary grasslands that retain a component of larval food species. It was previously thought that the Golden Sun Moth occurred exclusively in grassland habitats dominated by species from the genus *Rytidosperma*, or Wallaby Grass. However, the species is also known to occur in degraded areas that retain some native larval food species or have been invaded by the introduced Needlegrass species such as Chilean Needle-grass *Nassella neesiana*, which is also a known food plant (DAWE, 2021d). While the species can occur in degraded sites which have been invaded by non-native species, it is important to note that the natural habitat of the Golden Sun Moth is native grasslands which include Wallaby-grass *Rytidosperma* and Spear-grass *Austrostipa* species ((SWIFFT, 2022b). Further, the species' Conservation Advice refers to important (or high quality) habitat as those which contain native grassland with *Rytidosperma* and/or Spear-grass *Austrostipa* species, low weed cover, inter-tussock spaces, and suitable land management (DAWE, 2021d).

Scientific name	Common name	Listing status	Category	Justification
				Threats to the species include the loss, fragmentation and degradation of habitat, invasive species, inappropriate fire regimes, climate change and installation of artificial structures (DAWE, 2021d). The species has been recorded within the NGGA (EHP, 2021). Further detailed assessment is needed to understand the potential for direct, indirect and cumulative impacts. Refer to Section 19.1 of Part 4 for the detailed impact assessment of the Golden Sun Moth.

THREATENED ECOLOGICAL COMMUNITY CATEGORISATION

Table 3: Categorisation of Commonwealth-listed threatened ecological communities

TEC name	EPBC listing	Category	Justification
Assemblages of Species Associated with Open-Coast Salt-Wedge Estuaries of Western and Central Victoria Ecological Community	Endangered	2	This community is an assemblage of native flora, fauna and microorganisms which occur in salt-wedge estuarine environments. Salt-wedge estuaries occur where rapidly flowing rivers discharge into the ocean and where tidal currents are weak. In these environments, sea water occurs as a wedge-shaped bottom layer which has minimal mixing with the upper layer of freshwater (DoEE, 2018a). This community is associated with open coastal environments, typically with small tides (<2 m) and high wave energies. It occurs along the western and central coastlines of Victoria (DoEE, 2018a). Key biota within this community includes macrophytes, phytoplankton, protists and zooplankton, which occur within the water column, on associate substrates, or on submerged or intermittently submerged vegetation along the edges of the estuarine environment (DoEE, 2018a). This vegetation community is not present within the Strategic Assessment Area. As an open coast community, it has potential to be present at the southernmost extremity of the Study Area in the region where the Lake Connewarre Complex discharges into the ocean. It is considered highly unlikely that the Plan would result in indirect impacts to this community. This is due to the distance of this environment from the Strategic Assessment Area, and the mitigation measures under the Plan to minimise indirect impacts to water flow and quality to downstream areas.
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	2	This community occurs in south-west Victoria, from Melbourne in the east to the Hamilton region in the west. It is a eucalypt woodland which is confined to Quaternary basaltic soils, on flat plains, gently undulating slopes or stony rises. The canopy is usually dominated by River Red Gum (*Eucalyptus camaldulensis*), although other eucalypt species may be dominant in some environments. The understorey comprises a diverse ground layer of grasses and herbs, with few shrubs. The community may also occur as a derived grassland, where trees have been removed yet the groundcover remains intact (DEWHA, 2009a). This vegetation community was not detected within either Growth Area during site surveys (EHP, 2021). Further, mapping of pre-1750 vegetation communities (DELWP, 2022a) indicates that the Strategic Assessment Area is predicted to be comprised almost entirely of grassland communities. Given that this community was not observed during site surveys, and that the Strategic Assessment Area is predicted to support grassland communities, it is considered unlikely that this community would occur within the Strategic Assessment Area (or that any potential occurrences of the community would be minor). While it is possible that this community may exist within the wider Study Area, the potential for indirect impacts under the Plan is considered to be unlikely given that the community is not a water-based or

TEC name	EPBC listing	Category	Justification
			riparian community and therefore is unlikely to occur in downstream areas of the Strategic Assessment Area.
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	2	This community comprises a tree canopy which is typically dominated by Grey Box (*Eucalyptus macrocarpa*), with other trees also potentially present. The understorey is a diverse ground layer of grasses and herbs, with occasional shrubs. The community may also occur as a derived grassland, where trees have been removed yet the groundcover remains intact (DEWHA, 2010a). It occurs on the drier edge of the temperate grassy eucalypt woodland belt. The community occurs from central NSW, through northern Victoria into SA. Disjunct occurrences are also found west of Melbourne and near Adelaide (DEWHA, 2010a). This vegetation community was not detected within either Growth Area during site surveys. Further, no Grey Box individuals were detected (EHP, 2021). Given that the Strategic Assessment Area is modelled to have historically comprised of a native grassland community (DELWP, 2022a), it is considered unlikely that grassland communities within the Strategic Assessment Area would constitute derived grasslands of this vegetation community. While it is possible that this community may exist within the wider Study Area, the potential for indirect impacts under the Plan is considered to be unlikely given that the community is not a water-based or riparian community and therefore is unlikely to occur in downstream areas of the Strategic Assessment Area. Further, is noted that this community is not predicted to occur within a 10 km radius of the two Growth Areas (EHP, 2021). This further reduces the potential for indirect impacts to this community.
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	2	This is a type of grassland community whose occurrence is restricted to the South East Coastal Plain IBRA bioregion of Victoria. It is likely that the community historically occurred on the floodplains of the lower reaches of rivers in south-west Victoria prior to European settlement (DoE, 2015a). Most occurrences of the community are in the Gippsland Plain subregion, with some occurrences in the Otway Plain subregion. In the region surrounding Geelong, the distribution is poorly known and has not been thoroughly surveyed or studied. The community may occur along the lower reaches of the Barwon River, at a site within the Connewarre Wildlife Reserve, although further surveys are required to confirm its presence at this location. As part of a protected area, this site is currently managed for conservation purposes (DoE, 2015a). The community ranges from grassland to open grassy woodland with scattered trees and shrubs. It is found on heavy, poorly drained soils which are often damp and sometimes waterlogged. The grassland is typically dominated by Kangaroo Grass *(Themeda triandra*) or Tussock Grass (*Poa labillardierei*). The

TEC name	EPBC listing	Category	Justification
			community also supports a range of other species including herbs and forbs. Species composition varies depending on moisture and seasonal conditions (DoE, 2015a). Threats to this community include weed invasion, inappropriate biomass management regimes (including slashing, mowing, grazing and fire regimes), disturbance from infrastructure maintenance, fertiliser residues, changes to hydrology, clearing, and fragmentation (DoE, 2015a). This vegetation community is not present within the Strategic Assessment Area, as the Strategic Assessment Area is not a coastal plain environment. Further, the Strategic Assessment Area is not located within the South East Coastal Plain IBRA bioregion. It is possible that the community may be present along the lower reaches of the Barwon River. This area is downstream of the Strategic Assessment Area. However, it is considered unlikely that the Plan would impact upon this community in this location. This because the main potential impact pathway to the community due to the Plan is through changes to water flow and quality. The Plan includes a commitment which will suitably mitigate this impact, through undertaking technical studies to understand key risks to water flow and quality, preparing guidelines based on the result of these studies, and undertaking planning scheme amendments to implement the guidelines. This commitment is supported by a range of existing measures in the planning system to minimise impacts to water flow and quality. Overall, it is considered unlikely that implementation of the Plan would result in impacts to this community.
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	1	This community is a complex and variable ecological community, with species composition and appearance varying based on environmental conditions and seasonal variations. The vegetation of Natural Temperate Grassland is mostly limited to a ground layer of grasses and herbs. Large trees are absent to sparse (TSSC, 2008). The TEC is dominated by a layer of native tussock-forming perennial grasses. The spaces between tussock grasses are interspersed with a variety of herbs (DEWHA, 2008d). The community has a very restricted geographic distribution and is limited to the basalt plains of Victoria, extending from Melbourne west to Hamilton. It has declined in extent and community integrity (DEWHA, 2008d). This community was identified within NGGA during site surveys and has potential for direct and indirect impacts (EHP, 2021). Further detailed assessment is required. Refer to Chapter 21 of Part 4 for the detailed impact assessment of Natural Temperate Grassland.
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	2	This community occurs in the temperate zone of mainland south-eastern Australia, including south-eastern SA, Victoria, and southern NSW. It is found on flat plains or gentle slopes below 500 m elevation (DSEWPaC, 2012a).

TEC name	EPBC listing	Category	Justification
			The community comprises temporary freshwater wetlands which are seasonally inundated, typically filling after rains in winter and spring, and then drying out. Rainfall is the main water source for the community. The community occurs on fertile and poorly drained soils, on isolated depressions or drainage lines. Many occurrences of this community are very small (less than 1 hectare in size) (DSEWPaC, 2012a). Species composition of the community varies with these seasonal patterns and local site conditions. The community is dominated by a ground layer of wetland herbs, forbs and graminoid species, and trees are usually absent. The wetland usually has a sharp boundary in soil, topography or vegetation that distinguishes it from neighbouring vegetation communities, with few to no wetland specialist species in the adjacent communities. The community often occurs in association with natural temperate grasslands and grassy woodlands (DSEWPaC, 2012a) It is noted that modifications to other types of wetlands can result in this ecological community being present where it was previously absent. These modified wetlands are considered to be included as part of this threatened ecological community (DSEWPaC, 2012a) No vegetation likely to be part of this community was recorded during surveys. Further, no wetlands were recorded during surveys that are likely to meet the definition of this TEC (EHP, 2021). Modelling of wetland occurrence by DELWP (DELWP, 2022c) has not identified any other wetland areas within the Growth Areas which are likely to constitute this TEC. There are two wetlands modelled to occur within the NGGA. The first of these corresponds to a wastewater treatment plant adjacent to Anakie Road. The second of these appears to be related to two small farm dams (from aerial observations) located in the NGGA Conservation Area. This area was mapped as Plains Grassland (EVC 132) by (EHP, 2021). The TEC may occur approximately 4.6 km south of the WGGA near the intersection of McCanns Lane and the Hamilton Highway, outside of the Strategic Assessment Area (The City of Greater Geelong, 2021). More recent surveying of this area suggests that the occurrence does not represent the TEC. Further survey is required to confirm the presence of the TEC in this area. Indirect impacts to the TEC (if it does occur in this area) are unlikely given the distance from the Growth Areas, and the absence of hydrological links.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	2	This community occurs along the western slopes and tablelands of the Great Dividing Range, from southern Queensland, through NSW to Victoria. It occurs in areas with annual rainfall between 400-800 mm per annum at altitudes of 170-1,200 m above sea level (DECCW, 2010). The community is a grassy woodland community which is characterised by a diverse understorey of tussock grasses, herbs and occasional shrubs, with either White Box (*Eucalyptus albens*), Yellow Box (*Eucalyptus melliodora*) and/or Blakely's Red Gum (*Eucalyptus blakelyi*) as the dominant tree species. The

TEC name	EPBC listing	Category	Justification
			community may also occur as a derived grassland, where trees have been removed yet the groundcover remains intact Characteristics trees of this vegetation community have not been recorded during site surveys within the Growth Areas (EHP, 2021). The Strategic Assessment Area is modelled to have historically comprised of a native grassland community, not a woodland community (DELWP, 2022a). Further, the Strategic Assessment Area is located wholly within the Southern Volcanic Plain IBRA bioregion, and this community is not known to occur within this bioregion (DECCW, 2010). Overall, it is considered unlikely that this community would be present within the Strategic Assessment Area. It is unlikely that the community is present in areas downstream of the Strategic Assessment Area. The Strategic Assessment Area occurs up to approximately 100 m in elevation (and so all areas downstream would be at lower elevations than this), whereas this TEC occurs at altitudes above 170 (DECCW, 2010). Within the Study Area, elevations of 170 m or above occur within You Yangs Regional Park, and in the region associated with the Brisbane Ranges National Park in the north-west of the Study Area. Given the distance of these areas from the Strategic Assessment Area and the fact that they are upstream, it is considered unlikely that the Plan would result in indirect impacts to these environments.

FPAL SPECIES CATEGORISATION

Table 4: Categorisation of FPAL species

Scientific name	Common name	Proposed listing status	Category	Justification
Reptiles				
Chelodina longicollis	Eastern Long-necked Turtle	Vulnerable	2	The Eastern Long-necked Turtle has a broad distribution throughout south-east Australia including south-east Queensland, New South Wales, Victoria, and south-east South Australia. It occurs in the Murray-Darling drainage, the Paroo Drainage, and in the Cooper Creek drainage (Kennett *et al.*, 2009). The species uses a diversity of freshwater aquatic habitats, including lakes, farm dams, shallow temporary ponds, and permanent riverine waterholes. It is found in higher numbers within bodies of water which are remote from permanent rivers (Kennett *et al.*, 2009). The turtle likes to bask on rocks or logs in soft sandy areas. The species is dormant over winter and resides under logs or leaves. It may travel long distances during the dry season to find suitable habitat (DELWP, 2017). The main threats to the species include nest predation by introduced foxes, riverine habitat modification, and land use change impacting migrating turtles (Kennett *et al.*, 2009). There are a small number of scattered and isolated records across the Study Area, associated with different hydrology systems such as the Western Treatment Plant, Little River, the Barwon River and a number of smaller waterbodies. The nearest record occurs approximately 18.6 km (in stream length) south-east of the WGGA in a small tributary of the Barwon River (Waurn Ponds Creek). The creek occurs in an area surrounded by both urbanised and agricultural land. Given that the species is considered common throughout all major river systems within its range (Kennett *et al.*, 2009), the absence of abundant records indicates that the Study Area may not be an important area for the species. Further, any potential aquatic habitat within the Study Area is unlikely to be important considering the broad habitat preferences of the species. Development under the Plan is unlikely to affect the species or contribute to any recognised threats.
Lissolepis coventryi	Swamp Skink, Eastern Mourning Skink	Endangered	2	The Swamp Skink occurs in south-eastern Australia, ranging between Mt Gambier in the west, through Victoria, and likely to just north of the NSW border. It primarily inhabits coastal areas, with few inland populations. Its distribution is severely disjunct, having declined significantly following European settlement. In 1998, the species was known from 77 discrete sites, of which 72 were located in Victoria. Of the 72 in Victoria, 5 to 6 sites are presumed extinct, and 38 sites are thought unlikely to be viable. Only 12 sites (all in East Gippsland) are thought to be potentially secure (DAWE, 2022e).

Scientific name	Common name	Proposed listing status	Category	Justification
				The species occurs in densely vegetated saltwater and freshwater wetlands which have natural hydrological regimes and have suitable shelter sites. The species appears to have specific habitat requirements, favouring dense groundcover with little to no overstorey (DAWE, 2022e). Threats to the species include loss of habitat due to wetland draining for agriculture, altered river/wetland water regimes, pollution of rivers/wetlands/coastal environments resulting in changes to vegetation, impacts from pests and weeds, habitat fragmentation, impacts from recreational users, timber harvesting, climate change, disturbance from grazing, and habitat degradation due to phytophthora (DAWE, 2022e). There are no records of the species within the Study Area, although records occur along coastal areas to the east and west of the Study Area. The Study Area includes areas which are mapped within the draft Conservation Advice as localities where the species or species habitat 'may occur' (DAWE, 2022e). While the Study Area contains wetland habitat, the wetlands within the Study Area are already disturbed and experience altered hydrological regimes. The absence of species' records within the Study Area, the sensitivity of the species to disturbance, and the presence of existing threats within the Study Area, suggests that it is unlikely that the Study Area supports suitable habitat for the species. Development under the Plan is unlikely to affect the species or contribute to any recognised threats.
Pseudemoia rawlinsoni	Glossy Grass Skink, Swampland Cool-skink, Rawlinson's Window-eyed Skink	Vulnerable	2	The Glossy Grass Skink occurs in south eastern Australia in several disjunct areas, including south eastern South Australia, south western and south central Victoria, through the Snowy Mountains of NSW to the Brindabella Ranges of the ACT, and in Tasmania. The disjunct distribution of the species may be an artefact of historical clearing, and/or the cryptic nature of the species and associated challenges in finding and identifying it (Threatened Species Section, 2021). The species was described as being 'rare' in the Melbourne region in the 1990's (Hamer, 2011). The species' habitat use is consistent across its range. It occurs in sites with very humid microhabitats, including saltmarshes, boggy creek valleys, margins of permanent lakes and swamps in wet heathland, fens and bogs. It has been reported to thrive in anthropogenic habitats in several locations in Tasmania, such as marshy drainage lines in paddocks (Threatened Species Section, 2021). The skink shelters in dense vegetation, such as within the base of grass and rush tussocks and within rotting logs. The preference of the species for dense vegetation likely explains the species' rarity in known occurrences. (Threatened Species Section, 2021). Threats to the species include clearing/modification of habitat, altered hydrology of wetlands/swampy environments, inappropriate fire regimes, inappropriate recreational activities, climate change, and small populations increasing the risk of localised extinctions from stochastic events (Threatened Species Section, 2021).

Scientific name	Common name	Proposed listing status	Category	Justification
				There are no records of the Glossy Grass Skink within the Study Area, although potential habitat is available within the Study Area associated with wetland areas. While it is acknowledged that the species is cryptic in nature and its full distribution may not be known, given the lack of records and known populations of the species and the well-surveyed nature of the wetlands in the Study Area (as Ramsar sites, and as sites with high accessibility), it is considered unlikely that the species is present within these areas. Development under the Plan is unlikely to affect the species or contribute to any recognised threats.
Insects				
Agrostis infusa	Bogong Moth	Endangered	2	The Bogong Moth occurs across a large area of Australia. Over summer (from the end of September to February and March), adult Bogong Moths undertake a summer 'hibernation' referred to as estivation in the Australian Alps of Victoria and NSW, taking shelter in caves and rock crevices. Once summer ends, the moths disperse over large distances to breeding grounds. Once at the breeding grounds, the moths mate, lay eggs in the soil, and die. Juvenile moths which hatch and develop then repeat the migratory cycle (Warrant *et al.*, 2016). Outside of their summer estivation, Bogong Moths have been observed across Australia, south of the Tropic of Capricorn, including in Tasmania, from coastal NSW through to Perth (Warrant *et al.*, 2016). There is yearly variation in the larval range of the species, and uncertainty regarding the processes which influence this variation. It is thought that the breeding grounds and larval stages mostly occur in the soil of lowland Queensland, NSW, northern Victoria and South Australia (Wintle *et al.*, 2021). Uncertainty regarding the location of preferred breeding grounds of this species is a key limitation which makes it difficult to target conservation practices effectively for the species (Wintle *et al.*, 2021). Larvae occur in clay soils, where eggs hatch in autumn or early winter, and larvae feed on the young shoots of plants. Later stages of larvae sever plants at the base and draw them into tunnels for consumption during the day. The species passes through six instars before pupating over several weeks. Adult moths then emerge ready for migration in early to mid-spring (Wintle *et al.*, 2021). The main threats to the species are thought to include climate change (including temperature and rainfall changes) and agricultural practices (including conversion of cracking clay soil into farmland, agricultural weed management of fallow fields which may deprive larvae of a food source during development, and use of insecticides). Potential threats also include distracting during migration by artificial lights, predation by native and introduced pests in estivation caves, and altered fire regimes (Wintle *et al.*, 2021). There are no VBA records of the Bogong Moth within the Study Area. While there is uncertainty regarding the preferred breeding locations of the species, it is thought that within Victoria, breeding grounds mostly occur within the north of the state (Wintle *et al.*, 2021). Further, development under the Plan will not exacerbate threats to the species, as identified known and potential threats are already present within the Study Area.

Scientific name	Common name	Proposed listing status	Category	Justification
				Overall, development under the Plan is unlikely to affect the species or contribute to any recognised threats.
Fish				
Galaxiella toourtkoourt	Little Galaxias	Vulnerable	1	*Galaxiella toourtkoourt* is a tiny freshwater fish, with females recorded to 42 mm and males 34 mm. The species was previously known as *Galaxiella pusilla,* though genetic studies have identified substantial differences between populations in western Victoria and south Australia (the west region), to eastern Victoria. The species has been re-described as two species, *Galaxiella toourtkoourt* and *Galaxiella pusilla* (Coleman, Hoffman and Raaik, 2015). Prior to taxonomic revision, both species were listed as Vulnerable as *Galaxiella pusilla*. *G. toourtkoourt* is distributed from the upper Barwon River (near Barwon Downs) in Victoria west to Cortina Lakes in SA. The species is typically found in swamps, wetlands, shallow lakes, billabongs, small creeks and earthen drains (Coleman, Hoffman and Raaik, 2015) Threats to the species may include the degradation and loss of habitat, alterations to flow regimes, climate change, introduced aquatic species, and illegal collection (Saddlier, Jackson and Hammer, 2010). Site surveys indicated the presence of suitable habitat for the Little Galaxias within the Moorabool River and Cowies Creek (EHP, 2021). There are no VBA records of the Little Galaxias within the Study Area. However, the species is known to occur within the upper Barwon River catchment near Barwon Downs, and in the Moorabool River near Batesford (EHP, 2021). It is noted that Batesford is within the Study Area and is near the Strategic Assessment Area. It is possible that there are records of the species in this area which have not been entered into the VBA database. The Corangamite CMA is proposing to remove in-stream barriers associated with Batesford quarry within the next few years which may allow the Little Galaxias to access upstream habitat within the Moorabool River. With the removal of these barriers, future planning within WGGA should assume the presence of the Little Galaxias (EHP, 2021). There will be no development within the Moorabool River or Cowies Creek under the Plan, and as such, there is no potential for direct impacts to the species. However, potential indirect impacts to the species as a result of development may be possible. Further detailed assessment is required to understand potential impacts. Due to the recent taxonomic revision, and pending listing of *G. toourtkoourt,* it is appropriate to assess this species as a threatened species. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Little Galaxias.
Flora				
Thelymitra lucida	Glistening Sun-orchid	Endangered	2	*Thelymitra lucida* (Glistening Sun-orchid) occurs in Victoria, Tasmania and South Australia (Department of Natural Resources and Environment Tasmania, no date). In Victoria, it is known from the Grampians, and near Digby, and Brisbane Ranges National Park (VIC Flora, 2024). There are three records of the species within Brisbane Ranges

Scientific name	Common name	Proposed listing status	Category	Justification
				National Park, two of which are dated 1989, with the third recorded in 1991 (DELWP, 2022b). Glistening Sun-orchid is rare and has a highly localised distribution (Department of Natural Resources and Environment Tasmania, no date). Glistening Sun-orchid grows near or in swamps and sometimes in standing water. It grows on moist sandy or peaty soils (Department of Natural Resources and Environment Tasmania, no date). Threats to the species include land clearing or changed management, weed invasion, inappropriate disturbance, climate change, and stochastic events (Department of Natural Resources and Environment Tasmania, no date). There are no VBA records of the species within the Study Area. The closest record is approximately 24 km north of the NGGA in Brisbane Ranges National Park (dated 1989). While the Study Area contains wetland habitat, the wetlands within the Study Area are already disturbed and experience altered hydrological regimes. The absence of species' records within the Study Area, and lack of recent records in the broader region indicates that the Study Area is unlikely to be important for the species. Development under the Plan is unlikely to affect the species or contribute to any recognised threats.

FPAL COMMUNITIES CATEGORISATION

Table 5: Categorisation of FPAL ecological communities

Proposed TEC name	Proposed listing	Category	Justification
Temperate coastal oyster beds and reef	Critically Endangered	2	This proposed TEC was nominated for listing under the EPBC Act in 2018. There is limited publicly available information regarding the proposed community and its possible distribution. At the time of listing, the proposed TEC was described to comprise of temperate intertidal or subtidal oyster beds/reefs and associated species, occurring in the marine and estuarine waters of eastern and southern Australia. This type of community has been heavily cleared with only a small proportion remaining. Key threats include historical overexploitation and harvesting, increasing urbanisation of catchments and coastlines, increasing disease and pest prevalence, water pollution, sedimentation and altered flow regimes (DoEE, 2018b). The nomination is noted to be based on work completed by the NESP Marine Hub (Gillies, Creighton and McLeod, 2015). This report describes the historical and current extent of shellfish reefs across Australia. Port Phillip is identified as a site which historically supported substantial shellfish reef communities. However, these ecosystems at this site have experienced a dramatic decline due to overexploitation, water quality declines, and other forms of anthropogenic disturbance. While it is no longer clear if the community exists in Port Phillip, isolated individual and small clumps of oysters remain in sparsely distributed areas in Port Phillip. For this reason, Port Phillip has been identified as a potential site for restoration of shellfish reef ecosystems. While there is a lack of clarity around the definition and distribution of this TEC, it is considered likely that the TEC may be present in small areas within Port Phillip Bay. However, it is considered unlikely that the Plan would impact upon this TEC. This is because the main potential impact pathway to the TEC due to the Plan is through changes to water flow and quality. The Plan includes a commitment which will suitably mitigate this impact, through undertaking technical studies to understand key risks to water flow and quality, preparing guidelines based on the result of these studies, and undertaking planning scheme amendments to implement the guidelines. This commitment is supported by a range of existing measures in the planning system to minimise impacts to water flow and quality. Overall, it is considered unlikely that implementation of the Plan would result in impacts to this proposed TEC.

MIGRATORY SPECIES CATEGORISATION

Table 6 Categorisation results for Commonwealth-listed migratory bird species

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
Actitis hypoleucos	Common Sandpiper	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	No individuals of the Flesh-footed Shearwater have been recorded within the Study Area within the past 5 years. No important habitat for the Common Sandpiper has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2
Anous stolidus	Common Noddy	Mig, C, J	None	No	No	One individual of the Common Noddy has been recorded within the Study Area, which is below the threshold of an ecologically significant proportion of the species (180 individuals) (Commonwealth of Australia, 2020). Given the small number of records, it is unlikely that the Study Area supports important habitat for this species. The Plan will not impact this species.	Category 2
Apus pacificus	Fork-tailed Swift	Mig, C, J, K	Draft referral guidelines for 14 migratory birds (DoE, 2015c)	Yes	No	819 individuals of the Fork-tailed Swift have been recorded within the Study Area, which is above the threshold of an ecologically significant proportion of the species (100 individuals) (DoE, 2015c). Species records range in age from 1898 through to 2015 and occur scattered across the eastern half of the Study Area. Within this area, there is no location where record densities are substantially greater than elsewhere. The Migratory Bird Referral Guidelines describes important habitat for the species as follows: "Non breeding habitat only; Found across a range of habitats, from inland open plains to wooded areas, where it is exclusively aerial." (DoE, 2015c). The species' SPRAT profile notes that the species is widespread but sparsely scattered across Victoria. It is insectivorous which forages, loafs and probably roosts aerially, although the species is occasionally observed to land. The species forages along the edges of low-pressure weather systems which assist with flight (DCCEEW, 2022a).	Category 2

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
						Given that the species occurs in a widespread but sparse manner across Victoria and given that the last known record of the species within the Study Area was from 2015, it is unlikely that the Study Area contains important habitat for the species. Further, given that the species is almost exclusively aerial and insectivorous, it is unlikely that the Plan would result in impacts to the species.	
Ardenna carneipes	Flesh-footed Shearwater, Fleshy-footed Shearwater	Mig, J, K	None	No	No	No individuals of the Flesh-footed Shearwater have been recorded within the Study Area. Given the absence of records of the species, it is unlikely the Study Area supports important habitat for the species. The Plan will not impact this species.	Category 2
Ardenna grisea	Sooty Shearwater	V, Mig, J	None	No	No	One individual of the Sooty Shearwater has been recorded within the Study Area, which is below the threshold of an ecologically significant proportion of the species (19,000 individuals) (Commonwealth of Australia, 2020). Given the small number of records, it is unlikely that the Study Area supports important habitat for this species. The Plan will not impact this species.	Category 2
Arenaria interpres	Ruddy Turnstone	V, Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	There have been no records of Ruddy Turnstone within the last five years. Therefore, an ecologically significant proportion of the species (30 individuals within the last 5 years) has not been met (Hansen *et al.*, 2016; DoE, 2017a). Historical records of the species mostly occur on the shoreline of Port Phillip bay, primarily between Avalon Beach and little River Bird Hide. Scattered records occur around Point Henry. Development under the Plan is unlikely to result in indirect impacts to these areas due to the significant existing development surrounding Port Phillip Bay. No important habitat for the Ruddy Turnstone has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2
Calidris acuminata	Sharp-tailed Sandpiper	V, Mig, B, C, J, K	EPBC Act Policy	-	-	This species has been triggered as a Category 1 threatened species.	Category 1

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
			Statement 3.21 (DoE, 2017a)			Note that assessment of this species is contained within the threatened fauna assessment in Chapter 19. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Sharp-tailed Sandpiper.	
Calidris alba	Sanderling	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	Yes	The species has not been recorded within the Study Area over the last five years. Therefore, an ecologically significant proportion of the species (30 individuals within the last 5 years) has not been met (Hansen *et al.*, 2016; DoE, 2017a). Important habitat for the Sanderling has been mapped by Birdlife Australia within the Study Area at Werribee/Avalon IBA (Weller *et al.*, 2020). Analysis of all species' records (with date filters removed) indicate that the species' known occurrence within the Werribee/Avalon IBA region is from the Avalon Beach locality in the west and extends east into the region of The Spit Wildlife Reserve. This area will not be impacted by the Plan as it is not located downstream of the Strategic Assessment Area.	Category 2
Calidris canutus	Red Knot, Knot	V, Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	-	-	This species has been triggered as a Category 1 threatened species. Note that assessment of this species is contained within the threatened fauna assessment in Chapter 19. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Red Knot.	Category 1
Calidris ferruginea	Curlew Sandpiper	CE, Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	-	-	This species has been triggered as a Category 1 threatened species. Note that assessment of this species is contained within the threatened fauna assessment in Chapter 19. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Curlew Sandpiper.	Category 1
Calidris melanotos	Pectoral Sandpiper	Mig, B, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	There has been one individual of the Pectoral Sandpiper recorded within the Study Area over the past 5 years, which is below the threshold of an ecologically significant proportion of the species (1,220 individuals within the last 5 years) (Hansen *et al.*, 2016; DoE, 2017a). No important habitat for the Pectoral Sandpiper has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
Calidris pugnax	Ruff	Mig, B, C, J, K	None	No	No	No individuals of the Ruff have been recorded within the Study Area. Given the absence of records of the species, it is unlikely the Study Area supports important habitat for the species. The Plan will not impact this species.	Category 2
Calidris ruficollis	Red-necked Stint	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	Yes	Yes	3,875 individuals of the Red-necked Stint have been recorded within the Study Area within the past 5 years, which is above the threshold of an ecologically significant proportion of the species (475 individuals within the last 5 years) (Hansen *et al.*, 2016; DoE, 2017a). All of these recent individuals occur along the northern coastline of Port Phillip Bay, extending from Avalon Beach in the west to the boundary of the Study Area in the east. This area will not be impacted by the Plan as it is not located downstream of the Strategic Assessment Area. Important habitat for the Red-necked Stint has been mapped by Birdlife Australia within the Study Area in the following localities (Weller *et al.*, 2020): • Lake Connewarre and Barwon River Estuary IBA • Werribee/Avalon IBA • Moolap IBA These IBAs extend outside of the locations of recent (2017 onwards) records of the species. However, when date filters are removed and all available records of the species are considered, substantial records of the species occur within the Lake Connewarre wetland complex and in the Moolap locality. A small number of records also occur in the vicinity of Limeburners Lagoon. The Moolap IBA will not be adversely impacted by development under the Plan as it is not downstream of the Strategic Assessment Area. However, there is potential for impacts to occur to the Lake Connewarre wetland complex and Limeburners Lagoon, as these localities are downstream of the Growth Areas. Historical records of the species in these habitats, and identification of these habitats as IBAs for the species by Birdlife Australia, suggest that these areas are important for the species, despite the lack of recent records in these localities. For this reason, this	Category 1

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
						species has been assigned to Category 1 for a detailed assessment. Refer to Chapter 23 of Part 4 for the detailed impact assessment of the Red-necked Stint.	
Calidris subminuta	Long-toed Stint	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	No individuals of the Long-toed Stint have been recorded within the Study Area within the past 5 years, which is below the threshold of an ecologically significant proportion of the species (230 individuals within the last 5 years) (Hansen *et al.*, 2016; DoE, 2017a). No important habitat for the Long-toed Stint has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2
Calidris tenuirostris	Great Knot	V, Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	-	-	This species has been triggered as a Category 1 threatened species. Note that assessment of this species is contained within the threatened fauna assessment in Chapter 19. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Great Knot.	Category 1
Charadrius bicinctus	Double-banded Plover	Mig, B	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	Yes	Four individuals of the Double-banded Plover have been recorded within the Study Area within the past 5 years, which is below the threshold of an ecologically significant proportion of the species (19 individuals within the last 5 years) (Hansen *et al.*, 2016; DoE, 2017a). These individuals are recorded to occur along the northern coastline of Port Phillip Bay, adjacent to The Spit Wildlife Reserve. This area will not be impacted by the Plan as it is not located downstream of the Strategic Assessment Area. Important habitat for the Double-banded Plover has been mapped by Birdlife Australia within the Study Area in the following localities (Weller *et al.*, 2020): • Lake Connewarre and Barwon River Estuary IBA • Werribee/Avalon IBA • Moolap IBA While few individuals of the Double-banded Plover have been recorded within the last 5 years, it is noted that when historical records are	Category 1

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
						considered, a substantial number of individuals has been recorded within the Study Area within recent years (7,992 individuals from 1990 onwards). When records from 1990 onwards are considered, substantial records of the species occur within the Lake Connewarre wetland complex and in the Moolap locality. A small number of records also occur in the vicinity of Limeburners Lagoon. The Moolap IBA will not be impacted by the Plan as it is not located downstream of the Strategic Assessment Area. However, there is potential for impacts to occur to the Lake Connewarre wetland complex and Limeburners Lagoon, as these localities are downstream of the Growth Areas. Historical records of the species in these habitats, and identification of these habitats as IBAs for the species by Birdlife Australia, suggest that these areas are important for the species, despite the lack of recent records in these localities. For this reason, this species has been assigned to Category 1 for a detailed assessment. Refer to Chapter 23 of Part 4 for the detailed impact assessment of the Double-banded Plover.	
Charadrius leschenaultii	Greater Sand Plover, Large Sand Plover	V, Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	-	-	This species has been triggered as a Category 1 threatened species. Note that assessment of this species is contained within the threatened fauna assessment in Chapter 19. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Greater Sand Plover.	Category 1
Charadrius mongolus	Lesser Sand Plover, Mongolian Plover	E, Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	-	-	This species has been triggered as a Category 1 threatened species. Note that assessment of this species is contained within the threatened fauna assessment in Chapter 19. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Lesser Sand Plover.	Category 1
Diomedea antipodensis	Antipodean Albatross	V, Mig, B	None	No	No	No individuals of the Antipodean Albatross have been recorded within the Study Area. Given the absence of records of the species, it is unlikely the Study Area supports important habitat for the species. The Plan will not impact this species.	Category 2

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
Diomedea epomophora	Southern Royal Albatross	V, Mig, B	None	No	No	No individuals of the Southern Royal Albatross have been recorded within the Study Area. Given the absence of records of the species, it is unlikely the Study Area supports important habitat for the species. The Plan will not impact this species.	Category 2
Diomedea exulans	Wandering Albatross	V, Mig, B	None	No	No	16 individuals of the Wandering Albatross have been recorded within the Study Area, which is below the threshold of an ecologically significant proportion of the species (18 individuals) (DCCEEW, 2022a). The species is a wide-ranging marine species which breeds on a number of subantarctic islands. It feeds mainly in pelagic, offshore and inshore waters, feeding mainly on squid and fish, but also crustaceans and carrion (DCCEEW, 2022a). Given the small number of records and the species' ecological characteristics, it is unlikely that the Study Area supports important habitat for this species. The Plan will not impact this species.	Category 2
Diomedea sanfordi	Northern Royal Albatross	E, Mig, B	None	No	No	No individuals of the Northern Royal Albatross have been recorded within the Study Area. Given the absence of records of the species, it is unlikely the Study Area supports important habitat for the species. The Plan will not impact this species.	Category 2
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	V, Mig, B, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	-	-	This species has been triggered as a Category 1 threatened species. Note that assessment of this species is contained within the threatened fauna assessment in Chapter 19. Refer to Section 19.6 of Part 4 for the detailed impact assessment of Latham's Snipe.	Category 1
Gallinago megala	Swinhoe's Snipe	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	No individuals of the Swinhoe's Snipe have been recorded within the Study Area within the past 5 years, which is below the threshold of an ecologically significant proportion of the species (40 individuals within the last 5 years) (Hansen *et al.*, 2016; DoE, 2017a). No important habitat for the Swinhoe's Snipe has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
Gallinago stenura	Pin-tailed Snipe	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	No individuals of the Pin-tailed Snipe have been recorded within the Study Area within the past 5 years, which is below the threshold of an ecologically significant proportion of the species (170 individuals within the last 5 years) (Hansen *et al.*, 2016; DoE, 2017a). No important habitat for the Pin-tailed Snipe has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2
Hirundapus caudacutus	White-throated Needletail	V, Mig, C, J, K	Draft referral guidelines for 14 migratory birds (DoE, 2015c)	Yes	No	745 individuals of the White-throated Needletail have been recorded within the Study Area, which is above the threshold of an ecologically significant proportion of the species (10 individuals) (DoE, 2015c). Records range in age from 1800 through to 2019. From 1990 to onwards, 670 individuals have been recorded within the Study Area. Records occur scattered throughout the Study Area, with slightly higher densities of records occurring within Geelong, You Yangs Regional Park, and within Brisbane Ranges National Park. The majority of records within You Yangs Regional Park, and within Brisbane Ranges National Park occur prior to 1990. The species has a widespread distribution in eastern and south-eastern Australia, occurring in all coastal regions of Queensland and NSW, and extending inland to the western slopes of the Great Dividing Range. In Victoria, the species is widespread, with most records occurring on or south of the Great Dividing Range, with few records in western Victoria. It is also widespread in Tasmania (TSSC, 2019b). The Migratory Bird Referral Guidelines describe important habitat for the species as follows: "Non-breeding habitat only: Found across a range of habitats, more often over wooded areas, where it is almost exclusively aerial. Large tracts of native vegetation, particularly forest, may be a key habitat requirement for species. Found to roost in tree hollows in tall trees on ridge-tops, on bark or rock faces. Appears to have traditional roost sites." (DoE, 2015c) The species is insectivorous. In Australia, threats to the species include use of insecticides, loss of forests and woodland habitats which may be	Category 2

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
						contributing to loss of roosting sites and reduction in invertebrate prey, and collisions with infrastructure such as wind turbines, windows and overhead wires (TSSC, 2019b). The Growth Areas and surrounds are likely to represent more marginal foraging habitat for the species. Development under the Plan is unlikely to affect the species or contribute to any recognised threats.	
Limicola falcinellus	Broad-billed Sandpiper	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	The species has not been recorded within the Study Area during the past 5 years. Therefore, an ecologically significant proportion of the species (30 individuals within the last 5 years) has not been met (Hansen *et al.*, 2016; DoE, 2017a). No important habitat for the Broad-billed Sandpiper has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2
Limosa lapponica	Bar-tailed Godwit	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	This species has been triggered as a Category 1 threatened species (as *Limosa lapponica baueri*). Note that assessment of this species is contained within the threatened fauna assessment in Chapter 19. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Bar-tailed Godwit.	Category 1
Limosa limosa	Black-tailed Godwit	E, Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	-	-	This species has been triggered as a Category 1 threatened species. Note that assessment of this species is contained within the threatened fauna assessment in Chapter 19. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Black-tailed Godwit.	Category 1
Macronectes giganteus	Southern Giant-Petrel, Southern Giant Petrel	E, Mig, B	None	No	No	31 individuals of the Southern Giant-Petrel have been recorded within the Study Area, which is below the threshold of an ecologically significant proportion of the species (92 individuals) (DCCEEW, 2022a). The Southern Giant-Petrel breeds on the Antarctic continent, subantarctic islands, and in South America. The species is widespread throughout the Southern Ocean, yet also occurs north into subtropical waters. It is a predator and a scavenger, feeding on penguin, seal, and whale carcasses. It also catches live birds such as albatrosses and smaller seabirds, in addition	Category 2

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
						to marine food sources including cephalopods, krill and fish (DCCEEW, 2022a). Given the small number of records and the species' ecological characteristics, it is unlikely that the Study Area supports important habitat for this species. The Plan will not impact this species.	
Macronectes halli	Northern Giant Petrel	V, Mig, B	None	No	No	11 individuals of the Northern Giant Petrel have been recorded within the Study Area, which is below the threshold of an ecologically significant proportion of the species (23 individuals) (DCCEEW, 2022a). The Northern Giant Petrel breeds on a range of islands, including South Georgia, Prince Edward Islands (South Africa), Crozet and Kerguelen Islands (French Southern Territories), Macquarie Island (Australia) and a range of New Zealand islands (Birdlife International, 2022). The species primarily occurs within sub-Antarctic to Antarctic waters yet can occur north into subtropical waters. It is a wide-ranging marine, oceanic species, feeding on seal, whale and penguin carrion, krill, cephalopods, and fish. It will kill and eat immature albatross and other seabird species. The species often follows ships to obtain offal (DCCEEW, 2022a). Given the small number of records and the species' ecological characteristics, it is unlikely that the Study Area supports important habitat for this species. The Plan will not impact this species.	Category 2
Motacilla flava	Yellow Wagtail	Mig, C, J, K	Draft referral guidelines for 14 migratory birds (DoE, 2015c)	No	No	No individuals of the Yellow Wagtail have been recorded within the Study Area, which is below the threshold of an ecologically significant proportion of the species (1,000 individuals) (DoE, 2015c). Given the absence of records of the species, it is unlikely that the Study Area supports important habitat for the species. The Plan will not impact this species.	Category 2
Numenius madagascariensis	Eastern Curlew, Far	CE, Mig, B, C, J, K	EPBC Act Policy	-	-	This species has been triggered as a Category 1 threatened species.	Category 1

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
	Eastern Curlew		Statement 3.21 (DoE, 2017a)			Note that assessment of this species is contained within the threatened fauna assessment in Chapter 19. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Eastern Curlew.	
Numenius minutus	Little Curlew, Little Whimbrel	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	No individuals of the Little Curlew have been recorded within the Study Area within the past 5 years, which is below the threshold of an ecologically significant proportion of the species (110 individuals within the last 5 years) (Hansen *et al.*, 2016; DoE, 2017a). No important habitat for the Little Curlew has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2
Numenius phaeopus	Whimbrel	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	No individuals of the Whimbrel have been recorded within the Study Area within the past 5 years, which is below the threshold of an ecologically significant proportion of the species (65 individuals within the last 5 years) (Hansen *et al.*, 2016; DoE, 2017a). No important habitat for the Whimbrel has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2
Pandion haliaetus	Osprey	Mig, B	Draft referral guidelines for 14 migratory birds (DoE, 2015c)	No	No	No individuals of the Osprey have been recorded within the Study Area, which is below the threshold of an ecologically significant proportion of the species (24 individuals) (DoE, 2015c). Given the absence of records of the species, it is unlikely that the Study Area supports important habitat for the species. The Plan will not impact this species.	Category 2
Phalaropus lobatus	Red-necked Phalarope	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	No individuals of the Red-necked Phalarope have been recorded within the Study Area within the past 5 years, which is below the threshold of an ecologically significant proportion of the species (250 individuals within the last 5 years) (Hansen *et al.*, 2016; DoE, 2017a). No important habitat for the Red-necked Phalarope has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
Phoebetria fusca	Sooty Albatross	V, Mig, B	None	No	No	No individuals of the Sooty Albatross have been recorded within the Study Area. Given the absence of records of the species, it is unlikely the Study Area supports important habitat for the species. The Plan will not impact this species.	Category 2
Pluvialis fulva	Pacific Golden Plover	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	No individuals of the Pacific Golden Plover have been recorded within the Study Area within the past 5 years. Therefore, an ecologically significant proportion of the species (120 individuals within the last 5 years) has not been met (Hansen *et al.*, 2016; DoE, 2017a). No important habitat for the Pacific Golden Plover has been mapped by Birdlife Australia within the Study Area(Weller *et al.*, 2020). The Plan will not impact this species.	Category 2
Pluvialis squatarola	Grey Plover	V, Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	No individuals of the Grey Plover have been recorded within the Study Area within the past 5 years, which is below the threshold of an ecologically significant proportion of the species (80 individuals within the last 5 years) (Hansen *et al.*, 2016; DoE, 2017a). No important habitat for the Grey Plover has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2
Sternula albifrons	Little Tern	V, Mig, B, C, J, K	None	Yes	Yes	This species has been triggered as a Category 1 threatened species. Note that assessment of this species is contained within the threatened fauna assessment in Chapter 19. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Little Tern.	Category 1
Thalassarche bulleri	Buller's Albatross, Pacific Albatross	V, Mig, B	None	No	No	No individuals of the Buller's Albatross have been recorded within the Study Area. Given the absence of records of the species, it is unlikely the Study Area supports important habitat for the species. The Plan will not impact this species.	Category 2
Thalassarche carteri	Indian Yellow-	V, Mig, B	None	No	No	4 individuals of the Indian Yellow-nosed Albatross have been recorded within the Study Area, which is below the threshold of an ecologically significant proportion of the species (67 individuals) (DCCEEW, 2022a).	Category 2

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
	nosed Albatross					The species is a marine bird which breeds on islands of the southern Indian Ocean, and which mostly forages in the Indian Ocean. In the Australasian region, the species occurs in inshore and offshore waters. It occurs along the entirety of the southern coast of Australia, ranging from north of Perth in Western Australia, to northern NSW in the east. It is most abundant off the coast of Western Australia. Its diet includes cephalopods and fish (DCCEEW, 2022a). Given the small number of records and the species' ecological characteristics, it is unlikely that the Study Area supports important habitat for this species. The Plan will not impact this species.	
Thalassarche cauta	Shy Albatross	E, Mig, B	None	No	No	14 individuals of the Shy Albatross have been recorded within the Study Area, which is below the threshold of an ecologically significant proportion of the species (30 individuals) (DCCEEW, 2022a). The Shy Albatross is the only albatross species which is endemic to Australia, with breeding colonies on three small islands off Tasmania. Adults of the species primarily occur in waters adjacent to Tasmania and southern Australia, while juveniles have a much larger range, extending across the Indian Ocean to Africa and potentially to the south-western Atlantic Ocean. The species feeds primarily on fish and cephalopods, foraging in the marine environment (TSSC, 2020a). Threats to the species include fisheries bycatch, climate change, disease, interspecies competition, marine pollution, human disturbance of nesting colonies and historical harvest from the wild (TSSC, 2020a). Given the small number of records and the species' ecological characteristics, it is unlikely that the Study Area supports important habitat for this species. Further, the Plan will not exacerbate any threats to this species, and subsequently will not impact this species.	Category 2
Thalassarche chrysostoma	Grey-headed Albatross	E, Mig, B	None	No	No	No individuals of the Grey-headed Albatross have been recorded within the Study Area. Given the absence of records of the species, it is unlikely the Study Area supports important habitat for the species.	Category 2

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
						The Plan will not impact this species.	
Thalassarche impavida	Campbell Albatross, Campbell Black-browed Albatross	V, Mig, B	None	No	No	No individuals of the Campbell Albatross have been recorded within the Study Area. Given the absence of records of the species, it is unlikely the Study Area supports important habitat for the species. The Plan will not impact this species.	Category 2
Thalassarche melanophris	Black-browed Albatross	V, Mig, B	None	No	No	36 individuals of the Black-browed Albatross have been recorded within the Study Area, which is below the threshold of an ecologically significant proportion of the species (1,380 individuals) (DCCEEW, 2022a). The species breeds on subantarctic islands under Australian jurisdiction and is mostly confined to subantarctic and Antarctic waters during the breeding season. Outside of the breeding season, the species migrates north and forages across a wide area marine area, including along the southern continental shelf of Australia. The species forages on fish, cephalopods and crustaceans in the marine environment (DCCEEW, 2022a). Given the small number of records and the species' ecological characteristics, it is unlikely that the Study Area supports important habitat for this species. The Plan will not impact this species.	Category 2
Thalassarche salvini	Salvin's Albatross	V, Mig, B	None	No	No	No individuals of the Salvin's Albatross have been recorded within the Study Area. Given the absence of records of the species, it is unlikely the Study Area supports important habitat for the species. The Plan will not impact this species.	Category 2
Thalassarche steadi	White-capped Albatross	V, Mig, B	None	No	No	No individuals of the White-capped Albatross have been recorded within the Study Area. Given the absence of records of the species, it is unlikely the Study Area supports important habitat for the species. The Plan will not impact this species.	Category 2
Tringa brevipes	Grey-tailed Tattler	Mig, B, C, J, K	EPBC Act Policy	No	No	No individuals of the Grey-tailed Tattler have been recorded within the Study Area within the past 5 years, which is below the threshold of an	Category 2

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
			Statement 3.21 (DoE, 2017a)			ecologically significant proportion of the species (70 individuals within the last 5 years) (Hansen *et al.*, 2016; DoE, 2017a). No important habitat for the Grey-tailed Tattler has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	
Tringa glareola	Wood Sandpiper	Mig, B, C, J, K	None	No	No	No individuals of the Wood Sandpiper have been recorded within the Study Area, which is below the threshold of an ecologically significant proportion of the species (130 individuals within the last 5 years) (DoE, 2017b). No important habitat for the Wood Sandpiper has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2
Tringa nebularia	Common Greenshank, Greenshank	V, Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	-	-	This species has been triggered as a Category 1 threatened species. Note that assessment of this species is contained within the threatened fauna assessment in Chapter 19. Refer to Section 19.6 of Part 4 for the detailed impact assessment of the Common Greenshank.	Category 1

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
Tringa stagnatilis	Marsh Sandpiper, Little Greenshank	Mig, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	Yes	There has been one individual of the Marsh Sandpiper recorded in the Study Area within the past 5 years, which is below the threshold of an ecologically significant proportion of the species (130 individuals within the last 5 years) (Hansen *et al.*, 2016; DoE, 2017a). Important habitat for the Marsh Sandpiper has been mapped by Birdlife Australia within the Study Area in the following localities (Weller *et al.*, 2020): • Werribee/Avalon IBA • Moolap IBA While there has been minimal records of the Marsh Sandpiper within the last 5 years, it is noted that when historical records are considered, a substantial number of individuals have been recorded within the Study Area within recent years (10,296 individuals recorded since 1990). A large number of records occur along the northern coastline of Port Phillip Bay, extending from Avalon Beach in the west to the boundary of the Study Area in the east. This area will not be impacted by the Plan as it is not located downstream of the Strategic Assessment Area. A substantial number of records have been recorded in the Lake Connewarre Complex (1,068 individuals since 1990). This area has potential to be impacted by the Plan, as it is downstream of WGGA. Individuals are also recorded to occur within the Moolap region. This area will not be impacted by the Plan as it is not located downstream of the Strategic Assessment Area. Although the Lake Connewarre and Barwon River Estuary IBA was not identified as important habitat for the Marsh Sandpiper by Birdlife Australia (Weller *et al.*, 2020), the large number of records in recent years in this area and the potential for impacts under the Plan means this species has been assigned to Category 1 for detailed assessment. Refer to Chapter 23 of Part 4 for the detailed impact assessment of the Marsh Sandpiper.	Category 1

Scientific name	Common name	EPBC Status[1]	Applicable EPBC Policy	Categorisation criteria triggered[2]		Justification	Final category
				ESP[3]	IH[3]		
Xenus cinereus	Terek Sandpiper	V, B, C, J, K	EPBC Act Policy Statement 3.21 (DoE, 2017a)	No	No	No individuals of the Terek Sandpiper have been recorded within the Study Area within the past 5 years. Therefore, an ecologically significant proportion of the species (50 individuals within the last 5 years) has not been met (Hansen *et al.*, 2016; DoE, 2017a). No important habitat for the Terek Sandpiper has been mapped by Birdlife Australia within the Study Area (Weller *et al.*, 2020). The Plan will not impact this species.	Category 2

1: To save space, the following abbreviations are used: V: Vulnerable, E: Endangered, CE: Critically Endangered, P. Ex: Presumed Extinct, Ex: Extinct, FPAL: Finalised Priority Assessment List (meaning the species is currently undergoing a listing assessment), Mig: Migratory, B: Bonn, C: CAMBA, J: JAMBA, K: ROKAMBA

2: Categorisation criteria are given in Chapter 12, Section 12.3

3: To save space, the following abbreviations are used: ESP: Ecologically significant proportion of individuals present within Study Area, IH: Important habitat present within Study Area

Table 7: Categorisation results for other Commonwealth-listed migratory species

Scientific name	Common name	EPBC Status[1]	Categorisation criteria[2]		Reason[3]	Final category
			ESP[4]	IH[4]		
Balaena glacialis australis / Eubalaena australis	Southern Right Whale	Listed M as *B. glacialis australis* Listed E, B as *E. australis.*	No	No	2 records (one from 2006 and the other from 2007) occur within the Study Area. The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2
Balaenoptera musculus	Blue Whale	E, Mig, B	No	No	No records occur within the Study Area. The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2
Caperea marginata	Pygmy Right Whale	Mig, B	No	No	No records occur within the Study Area. The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2
Carcharias taurus	Grey Nurse Shark	Mig, B	No	No	No records occur within the Study Area. The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2
Carcharodon carcharias	White Shark, Great White Shark	V, Mig, B	No	No	No records occur within the Study Area. The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2
Caretta caretta	Loggerhead Turtle	E, Mig, B	No	No	No records occur within the Study Area. No nesting sites for the species occur within Victoria (DoEE, 2017a). The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2
Chelonia mydas	Green Turtle	V, Mig, B	No	No	No records occur within the Study Area. No nesting sites for the species occur within Victoria (DoEE, 2017a). The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2

Scientific name	Common name	EPBC Status[1]	Categorisation criteria[2]		Reason[3]	Final category
			ESP[4]	IH[4]		
Dermochelys coriacea	Leatherback Turtle, Leathery Turtle, Luth	E, Mig, B	No	No	2 records occur within the Study Area. Both are recorded on the same date in 2017 and likely relate to a single individual. No nesting sites for the species occur within Victoria (DoEE, 2017a). The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2
Lagenorhynchus obscurus	Dusky Dolphin	Mig, B	No	No	No records occur within the Study Area. The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2
Lamna nasus	Porbeagle, Mackerel Shark	Mig, B	No	No	No records occur within the Study Area. The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2
Lepidochelys olivacea	Pacific (Olive) Ridley	E, Mig, B	No	No	1 record occurs within the Study Area, which was recorded in 1974. There are no more recent records of the species in the Study Area. No nesting sites for the species occur within Victoria (DoEE, 2017a). The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2
Megaptera novaeangliae	Humpback Whale	Mig, B	No	No	No records occur within the Study Area. The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2
Orcinus orca	Killer Whale, Orca	Mig, B	No	No	No records occur within the Study Area. The species is a wide-ranging marine species and will not be impacted by the Plan	Category 2

1: To save space, the following abbreviations are used: V: Vulnerable, E: Endangered, CE: Critically Endangered, P. Ex: Presumed Extinct, Ex: Extinct, FPAL: Finalised Priority Assessment List (meaning the species is currently undergoing a listing assessment), Mig: Migratory, B: Bonn, C: CAMBA, J: JAMBA, K: ROKAMBA

2: Categorisation criteria are given in Chapter 12, Section 12.3

3: Unless otherwise stated, all distribution information is taken from the species' profile in the Species Profile and Threats Database (DCCEEW, 2022a)

4: To save space, the following abbreviations are used: ESP: Ecologically significant proportion of individuals present within Study Area, IH: Important habitat present within Study Area

B. Background information for the combined fauna assessment: birds

This attachment provides further information about the following bird species addressed in the combined fauna assessment in Section 19.6 of Chapter 19.

The species are:

- Australasian Bittern (*Botaurus poiciloptilus)*
- Australian Fairy Tern (*Sternula nereis nereis*)
- Australian Painted Snipe (*Rostratula australis*)
- Black-tailed Godwit (*Limosa limosa*)
- Common Greenshank (*Tringa nebularia*)
- Curlew Sandpiper (*Calidris ferruginea*)
- Eastern Curlew (*Numenius madagascariensis*)
- Great Knot (*Calidris tenuirostris*)
- Greater Sand Plover (*Charadrius leschenaultia*)
- Latham's Snipe (*Gallinago hardwickii*)
- Little Tern (*Sternula albifrons)*
- Lesser Sand Plover (*Charadrius m*ongolus)
- Orange-bellied Parrot (*Neophema chrysogaster*)
- Red Knot (*Calidris canutus*)
- Sharp-tailed Sandpiper (*Calidris acuminata*)
- Western Alaskan Bar-tailed Godwit (*Limosa lapponica baueri*)

The following information is provided for each species:

- Species background, including the species' ecology, distribution, habitat, populations, and threats
- A detailed description of the species' occurrence in the Study Area
- Identification and description of each of the relevant potential indirect impacts to each species due to development under the Plan
- An assessment of consistency of the Plan with the species' Recovery Plan
- Identification of relevant Key Threatening Processes and Threat Abatement Plans for each species

AUSTRALASIAN BITTERN (BOTAURUS POICILOPTILUS)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Endangered
DESCRIPTION	*Botaurus poiciloptilus* (Australasian Bittern) is a large heron-like bird. It has mottled brown, dark brown to black feathers, a straw-yellow bill and pale green to olive legs. The average male weighs 1.4 kg and the average female weighs 0.9 kg (TSSC, 2019a).
ECOLOGY	Breeding occurs from October to February. Females usually lay four to five olive-brown eggs. Nests are built on a bed of reeds in densely vegetated wetlands and placed about 30 cm above the water level. The species is territorial, and several females will nest within a single male's territory (TSSC, 2019a). The age of maturity is estimated to be one year, and life expectancy is thought to be around 11 years. Generation length is approximately 5.5 years. These figures are based on data for the Eurasian Bittern (*Botaurus stellaris*) (TSSC, 2019a). The species feeds mainly at night on fish, eels, frogs, freshwater crayfish and aquatic insects (Garnett, Szabo and Dutson, 2011). The species is mainly solitary but has been seen in pairs or groups of up to 12 birds (TSSC, 2019a). The species was previously thought to be largely sedentary, although more recent tracking studies have shown movements over hundreds of kilometres between wetlands in south-eastern Australia. The species appears to be capable of moving between habitats as suitability changes with flooding and drying patterns (TSSC, 2019a).
DISTRIBUTION AND HABITAT	The Australasian Bittern occurs in New Zealand, New Caledonia, and Australia. In Australia the species occurs in south-eastern Australia: throughout Tasmania, south-east of South Australia, through Victoria and NSW (excluding the north-west), and up to Yeppoon in Queensland. It also occurs in the south-west of Western Australia between Moora and Cape Arid (TSSC, 2019a). In Victoria, the species is recorded mostly in the southern coastal areas and in the Murray River region of central northern Victoria (TSSC, 2019a). In 2011, the area of occupancy in Australia was estimated to be 1,150 km2 (TSSC, 2011a). The area of occupancy is thought to have declined by 70 per cent from 1977 to 2008 (TSSC, 2019a). The species occurs mainly in freshwater wetlands, and more rarely in estuaries or tidal environments. Wetlands with tall, dense vegetation are favoured, particularly those dominated by sedges, rushes and reeds or cutting grass growing over muddy or peaty substrates. Foraging occurs in still, shallow water, often at the edges of pools or waterways. Foraging can also occur from vegetation platforms over deeper water (TSSC, 2011a). The species moves between habitats as suitability changes and has been observed to use coastal wetlands during periods of drought and ephemeral wetlands when wet (TSSC, 2019a). All natural habitat where the species is known or likely to occur is considered habitat critical to the survival of the species (TSSC, 2019a).
POPULATIONS	The Australasian Bittern occurs as two sub-populations: one in south-eastern Australia and the other in south-western Australia (TSSC, 2019a). In 2011, the total Australian population was estimated at 1,000 mature individuals (Garnett, Szabo and Dutson, 2011) Given the small total number of individuals and observed declines, all populations of the species should be considered important (TSSC, 2019a).

THREATS	The species Conservation Advice identified the following threats (TSSC, 2019a):
	• Habitat loss, including:
	  ○ Water reduction
	  ○ Transitions from ponded rice to other farming systems
	• Habitat degradation, including:

	○ Increased salinity, siltation and pollution ○ Grazing by livestock and feral animals ○ Changes in abundance of plant species (including native and introduced plants) ○ Inappropriate fire regimes ○ Urban wetland management • Climate change, including changes in water availability and fire regimes, and salination of coastal wetlands • Inappropriate placement of infrastructure such as fence lines and powerlines • Urban development, which can impact water quality and increase disturbance, particularly from domestic pets • Predation by foxes and cats
RELEVANT PLANS AND POLICIES	Conservation Advice *Botaurus poiciloptilus* Australasian Bittern (TSSC, 2019a) Commonwealth Listing Advice on *Botaurus poiciloptilus* (Australasian Bittern) (TSSC, 2011a) Threat abatement plan for predation by feral cats (DoE, 2015g) Threat abatement plan for predation by the European red fox (DEWHA, 2008f)
SPECIES-SPECIFIC GUIDELINES	There are no species-specific guidelines for this species.
SPRAT LINK	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1001

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Australasian Bittern used in this assessment were downloaded in February 2025.

	METHOD FOR IDENTIFYING POPULATIONS
	All records of the species within the Study Area are considered a single population. This is because the Australasian Bittern occurs as a single sub-population in south-eastern Australia (TSSC, 2019a).

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-13 for a map of records and habitat across the Study Area.

Records and potential habitat for the Australasian Bittern is associated with wetlands and watercourses. There are 150 records (comprising 194 individuals) from 1990 onwards of the Australasian Bittern within the Study Area. The most recent record of the species is from 2023.

A total of 8,244.5 ha of potential habitat has been mapped within the Study Area. Of this, 40.9 ha occurs within the Strategic Assessment Area. No habitat is mapped within the Growth Areas.

The species has not been recorded within the Strategic Assessment Area.

The majority of records occur within and near the Lake Connewarre Complex and along the coastline near Port Wilson.

The largest area of habitat is associated with the Lake Connewarre Complex, which is associated with multiple records of species (52 records which includes 89 individuals). Habitat in this area is connected to small, thin areas of upstream habitat mapped along the Barwon River and the Moorabool River. No records of the species occur along either of these rivers upstream of the Lake Connewarre Complex. However, there is one record (one individual) approximately 3 km upstream from the Lake Connewarre Complex in Waurn Ponds Creek, a tributary of Barwon River.

Habitat also occurs along the Port Phillip Bay shoreline, between Limeburners Bay in and the Port Wilson area. The majority of records within the Study Area are associated with this habitat, mainly to the east near Port Wilson (84 records which includes 85 individuals). This broad area of habitat is connected to two thin areas of habitat mapped along Hovells Creek, and along Little River (in the north-east of the Study Area, upstream of the Port Wilson locality). A small number of upstream records are associated with Hovells Creek. No upstream records occur along Little River.

Isolated records and habitat also occur as follows:

- Small areas of habitat are mapped along Cowies Creek. However, there are no records of the species in this locality
- A small area of mapped habitat occurs at Point Henry. There are a small number of records associated with this habitat
- Habitat occurs in the south of the Study Area along Thompson Creek. No records of the species are associated with this habitat
- Isolated records occur at Staughton Vale and to the north-east of You Yangs Regional Park. These areas are both located over 19 km from the Strategic Assessment Area, to the north-west and north-east respectively

DETAILED OVERVIEW OF SPECIES' SUSCEPTIBILITY TO INDIRECT IMPACTS

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice for the Australasian Bittern identifies a range of threats to the species (TSSC, 2019a). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

Decreased water quality due to siltation and pollution has been identified as a threat to the Australasian Bittern which is potentially relevant to implementation of the Plan.

There are a number of additional threats to the species identified in the Conservation Advice. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Part 5.

DECREASED WATER QUALITY DUE TO SILTATION AND POLLUTION

General reductions in water quality may pose a threat to the species' survival and breeding success and may also affect food sources for the species such as macrophytes, algae and invertebrates. Urban development near wetlands is recognised as a potential threat to water quality which may affect the species (TSSC, 2019a).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 8 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 8: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Australasian Bittern

Key threatening process	Threat abatement plan
Fire regimes that cause declines in biodiversity	There is no relevant TAP
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP
Predation by feral cats	Threat abatement plan for predation by feral cats (DoE, 2015g)
Predation by European red fox	Threat abatement plan for predation by the European red fox (DEWHA, 2008f)

AUSTRALIAN FAIRY TERN (*STERNULA NEREIS NEREIS*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Vulnerable
DESCRIPTION	*Sternula nereis nereis* (Australian Fairy Tern) is a small bird approximately 22 – 27 cm in length. It is bulky and round bodied. The breeding plumage is pale grey-white, with a black crown, and white forehead (DAWE, 2020).
ECOLOGY	The Australian Fairy Tern is gregarious and gathers at roost sites during and outside the breeding season (DAWE, 2020). The species breeds between June and March in colonies of between 2 and 400 pairs, and up to 700 pairs in Western Australia. Breeding colonies are located on coastal islands or coral cays, on sandy islands and beaches inside estuaries. Breeding colony location is associated with areas of high food abundance. Colonies may occur in the same general location for several seasons, and then shift to new locations (DAWE, 2020). Individuals lay 1 – 2 eggs. The species has a high natural breeding failure due to inundation from high tides and storm surges, or smothering by wind-blown sand (DAWE, 2020). The Australian Fairy Tern feeds almost exclusively on fish in near-shore waters adjacent to nesting colonies (DAWE, 2020).
DISTRIBUTION AND HABITAT	The Australian Fairy Tern occurs in southern Australia from the Montebello Islands of the Pilbara in Western Australia to Botany Bay NSW, with a gap in distribution across the Great Australian Bight (DAWE, 2020). Within Victoria, the species occurs in the following NRM regions – Corangamite, East Gippsland, West Gippsland, and Port Phillip and Western Port (DSEWPaC, 2011a). The number of nesting colonies has declined, particularly around the Victorian coastline (DAWE, 2020).The species extent of occurrence is approximately 380,000 km2 and the area of occupancy is estimated to be 1,150 km2 (DSEWPaC, 2011a). The Australian Fairy Tern uses a variety of habitats including offshore, estuarine or lacustrine (lake) islands, coastal wetlands, beaches and sand spits. Nesting habitat consists of a shallow scrape in the sand which may be lined with vegetation or small shells. In Victoria, the species uses seagrass covered beaches for nesting (DAWE, 2020). The species' Recovery Plan notes that it is not possible to generate one detailed description or definition of habitat critical to the survival of the species. Instead, the Recovery Plan notes that habitat critical to the survival of the species is more usefully considered at a bioregional scale, which acknowledges the species occurs within a mosaic of coastal habitats. As a guide, habitat critical to the survival of the species can be considered to comprise (DAWE, 2020): • *Suitable habitat where the species is known or likely to breed or forage as shown in the indicative distribution map* • *Any suitable habitat outside the above area that may be periodically occupied by non-breeding Australian Fairy Terns*
POPULATIONS	The population of the Australian Fairy Tern is estimated at 7,450, of which approximately 100 – 150 occur in Victoria. There has been a decline in breeding pairs within Victoria. There have been few records documenting successful breeding attempts over the last decade within Western Port Ramsar site and Port Phillip Bay. Gippsland Lakes Ramsar site continues to host breeding Australian Fairy Terns (DAWE, 2020). The Tasmanian and Victorian populations may form a single subpopulation (DAWE, 2020).
THREATS	The species Recovery Plan and Conservation Advice identifies the following threats (DSEWPaC, 2011a; DAWE, 2020): • Habitat degradation and loss of breeding habitat

	• Disturbance by humans, dogs and vehicles • Predation by introduced species such as foxes, dogs, cats, rats, and by native species • Road traffic mortality of chicks which are fledging or practising flight • Invasive plants • Climate variability and change, and extreme weather events • Inappropriate water regimes and water pollution in foraging habitat • Hybridisation with Little Terns
RELEVANT PLANS AND POLICIES	Approved Conservation Advice for *Sternula nereis nereis* (Fairy Tern) (DSEWPaC, 2011a) Commonwealth Listing Advice on *Sternula nereis nereis* (Fairy Tern) (TSSC, 2011b) National Recovery Plan for the Australian Fairy Tern (*Sternula nereis nereis*) (DAWE, 2020) Threat abatement plan for predation by feral cats (DoE, 2015g) Threat abatement plan for predation by the European red fox (DEWHA, 2008f)
SPECIES-SPECIFIC GUIDELINES	There are no species-specific guidelines for this species.
SPRAT LINK	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=82950

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Australian Fairy Tern used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS

	All records within the Study Area were considered a single population. This is because the species within Victoria is thought to comprise a single subpopulation population (DAWE, 2020).

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-14 for a map of records and habitat across the Study Area.

There are 925 records from 1990 onwards of the Fairy Tern within the Study Area (comprising 6,017 individuals). The most recent record was recorded in 2022. The species has not been recorded within the Strategic Assessment Area.

A total of 5,155.3 ha of potential habitat has been mapped within the Study Area. Of this, 5.1 ha of habitat occurs within the Strategic Assessment Area. No habitat has been mapped within the Growth Areas.

Mapped habitat and the majority of records (823 records, comprising 4,797 individuals) for the Australian Fairy Tern occur along the shoreline of Port Phillip Bay, from Limeburners Bay west through to the Study Area boundary in the north-east.

75 records (comprising 846 individuals) and mapped habitat occur in the Moolap locality. A smaller number of records (17 records, comprising 114 individuals) and mapped habitat occur at the Lake Connewarre Complex.

A smaller area of habitat not associated with records occurs in the estuarine environment of Thompson Creek in the south of the Study Area.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice and Recovery Plan for the Australian Fairy Tern identify a range of threats to the species (DSEWPaC, 2011a; DAWE, 2020). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Disturbance by humans, dogs and vehicles
- Inappropriate water regimes and water pollution in foraging habitat

There are a number of additional threats to the species identified in the Conservation Advice and Recovery Plan. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Part 5.

DISTURBANCE BY HUMANS, DOGS AND VEHICLES

The Australian Fairy Tern will enact an anti-predator response as humans and/or their dogs approach within 80-100 m. Adults tending nests will take flight to avoid disclosing the location of the nest, and will engage in noisy dives against intruders, including defecating on intruders (DAWE, 2020).

Repeated ongoing disturbance during colony establishment or during the early laying period will often result in site abandonment, while disturbance later in the breeding season may result in overheating or chilling of eggs, and death of chicks. Predators such as gulls and ravens have been known to opportunistically feed on exposed nests during periods of human disturbance (DAWE, 2020).

Successful strategies to protect nesting Australian Fairy Terns (and similar species including Hooded Plovers and Little Terns) have included chick shelters, community education, signage (combined with boundary delineation) and volunteer wardens. It is noted that education does not work on its own without a holistic approach which combines education, on-ground approaches, compliance programs and effectiveness reviews (DAWE, 2020).

INAPPROPRIATE WATER REGIMES AND WATER POLLUTION IN FORAGING HABITAT

Increased water discharge into estuaries can result in estuary overfilling and inundation of roosting and nesting sites. Reduced discharge into estuaries can also result in drying of estuaries, which closes the estuary mouth and prevents connection to the marine environment. Overfilling or underfilling of estuaries also impacts upon water salinities, which may render sites inappropriate for the species (DAWE, 2020).

Further, Australian Fairy Terns often locate colonies close to food resources (generally small schooling fishes). These fish often occur in locations of higher productivity, such as around estuary mouths. These locations may be compromised by poor water quality from drainage from a range of development types, including urban and rural areas, canal estates, boat harbours, coastal heavy industries and ports. Exposure of acid sulfate soils may also negatively impact upon water quality. These locations may be susceptible to accumulation of floating debris, pesticides, and contaminants such as heavy metals. There is currently no data on contaminant burden amongst Australian Fairy Terns in Victoria, although there is evidence of a contaminant burden within the species in other locations (DAWE, 2020).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

In accordance with Section 146K of the EPBC Act, this section considers whether the implementation of the Plan is not inconsistent with the species' Recovery Plan. It considers two questions:

- Does the Plan prevent achievement of the objectives of the Recovery Plan?
- Does the Plan prevent implementation of the Recovery Plan actions?

These questions are discussed below.

DOES THE PLAN PREVENT ACHIEVEMENT OF THE OBJECTIVES OF THE RECOVERY PLAN?

The overall objective of the Recovery Plan is as follows: by 2030, sustain a positive population trend (compared to 2020 baseline counts) in the number of mature individuals of the Australian Fairy Tern in both the eastern and western populations. This overall objective is associated with a series of specific strategies to achieve the objective (DAWE, 2020):

1. Manage and protect known Australian Fairy Tern breeding populations at the landscape scale
2. Develop and apply techniques to measure changes in population trend(s) in order to measure the efficacy of recovery actions
3. Reduce, or eliminate threats at breeding, non-breeding and foraging sites

4. Undertake research and monitoring to improve understanding of breeding, non-breeding and foraging attributes in order to better target management actions and habitat restoration
5. Engage community stakeholders in Australian Fairy Tern conservation
6. Coordinate, review and report on recovery progress

The outcome under the Plan for the Australian Fairy Tern will not prevent the achievement of any of the objectives of the Recovery Plan.

DOES THE PLAN PREVENT IMPLEMENTATION OF THE RECOVERY PLAN ACTIONS?

The Recovery Plan identifies a set of actions in order to deliver on the objectives. Each action is associated with performance criteria (DAWE, 2020). The Plan will not prevent the implementation of any of these actions, nor will it prevent the achievement of any of the performance criteria.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 9where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 9: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Fairy Tern

Key threatening process	Threat abatement plan
Fire regimes that cause declines in biodiversity	There is no relevant TAP
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP
Predation by feral cats	Threat abatement plan for predation by feral cats (DoE, 2015g)
Predation by the European red fox	Threat abatement plan for predation by the European red fox (DEWHA, 2008f)

AUSTRALIAN PAINTED SNIPE *(ROSTRATULA AUSTRALIS)*

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Endangered
DESCRIPTION	*Rostratula australis* (Australian Painted Snipe) is a medium sized stocky wading bird with blue-green legs and a long orange-pink bill. It has a brown head, nape and chest with comma shaped white markings around the eyes, white belly and a white harness shape marking from its breast to back. Its plumage is barred olive green and black (DSEWPaC, 2013b).
ECOLOGY	Relatively little is known about the ecology of this species, as it has few records, unpredictable movements, cryptic habits, and often occurs in reasonably inaccessible areas (DoEE, 2019). The species breeds all year round depending on available suitable wetland conditions. It has been known to lay up to four clutches of 2 to 6 eggs per year. Females mostly breed every two years (DCCEEW, 2022a). The species feeds on vegetation, seeds, and invertebrates such as insects, worms, molluscs, and crustaceans. It is mostly active at dawn, dusk and throughout the night (Garnett, Szabo and Dutson, 2011; DCCEEW, 2022a). It is generally seen singly or in pairs. Movement patterns are not well understood, the species may be dispersive or migratory (DCCEEW, 2022a).
DISTRIBUTION AND HABITAT	The species is only found in Australia and mainly occurs in the Murray Darling Basin. It is widespread across Australia (DSEWPaC, 2013b; DCCEEW, 2022a). Important areas for the species include the Murray Darling Basin, Queensland Channel Country, Fitzroy Basin of Central Queensland, south-eastern South Australia, and adjacent parts of Victoria (DSEWPaC, 2013b). It is associated with the following EPBC Act listed TECs (DSEWPaC, 2013b): • Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains • Upland Wetlands of the New England Tablelands The species inhabits ephemeral and permanent shallow freshwater wetlands, and occasionally in brackish wetlands. It favours a dense cover of grass and reeds (DSEWPaC, 2013b). Breeding habitat requirements may be quite specific (DoEE, 2019). Due to limited understanding of the species' ecology and habitat requirements, it is not possible to generate a detailed description or definition of habitat critical to the survival of the species (DoEE, 2019).
POPULATIONS	There are a number of population estimates for the species, ranging between 1,500 and 5,000 mature individuals. Population estimates are considered unreliable due to the species' cryptic nature, inaccessible habitat and limited numbers of surveys (DoEE, 2019). The species occurs as a single homogenous breeding population across the country (DoEE, 2019).
THREATS	The species Conservation Advice (DSEWPaC, 2013b) and draft Recovery Plan (DoEE, 2019) have identified the following threats • Loss of wetlands through drainage and the diversion of water for agriculture and reservoirs • Inappropriate hydrological regimes and declines in water quality • Grazing and the associated trampling of wetland vegetation/nests, nutrient enrichment and disturbance to substrate by livestock • Climate change, including reduced rainfall and runoff in the Murray-Darling Basin • Impacts from feral animals, including predation by cats and foxes, and habitat degradation by pigs, goats and deer • Invasive plants

	• Human disturbance of breeding birds • Inappropriate fire regimes • Low genetic diversity
RELEVANT PLANS AND POLICIES	Approved Conservation Advice for *Rostratula australis* (Australian Painted Snipe) (DSEWPaC, 2013b) Commonwealth Listing Advice on *Rostratula australis* (Australian Painted Snipe) (TSSC, 2013) It is noted that the species has a draft Recovery Plan which has been released for public consultation: Draft National Recovery Plan for the Australian Painted Snipe *Rostratula australis* (DoEE, 2019). Threat abatement plan for competition and land degradation by unmanaged goats (DEWHA, 2008e) Threat abatement plan for predation by feral cats (DoE, 2015g) Threat abatement plan for predation by the European red fox (DEWHA, 2008f) Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (DoEE, 2017b)
SPECIES-SPECIFIC GUIDELINES	Survey Guidelines for Australia's Threatened Birds. EPBC Act survey guidelines 6.2 (DEWHA, 2010b)
SPRAT LINK	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=77037

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Australian Painted Snipe used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS

	Given the mobile nature of the species, all records within the Study Area are considered a single population.

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-15 for a map of records and habitat across the Study Area.

There are seven records (19 individuals) of the Australian Painted Snipe within the Study Area, the most recent of which was recorded in 2013. The species has not been recorded in the Strategic Assessment Area.

A total of 7,828.4 ha of potential habitat has been mapped within the Study Area. Of this, 42.4 ha of habitat is mapped within the Strategic Assessment Area. No habitat has been mapped within the Growth Areas.

A large area of habitat and three records (8 individuals) of the species occur at the Lake Connewarre Complex.

Two records (2 individuals) occur in the north-east of the Study Area in the locality of Little River.

An isolated record (single individual) occurs at Brisbane Ranges National Park in the north-west of the Study Area.

Otherwise, habitat is mapped largely mapped along riparian habitats, including the Moorabool River, Barwon River, Hovells Creek, Little River, and Thompsons Creek. Some habitat is also mapped along the coastline in the Port Wilson area.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice (DSEWPaC, 2013b) and draft Recovery Plan (DoEE, 2019) for the Australian Painted Snipe identify a range of threats to the species. Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Inappropriate hydrological regimes and declines in water quality
- Human disturbance of breeding birds

There are a number of additional threats to the species identified in the Conservation Advice and draft Recovery Plan. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Part 5.

INAPPROPRIATE HYDROLOGICAL REGIMES AND DECLINES IN WATER QUALITY

Inappropriate hydrological regimes which can impact the species include reduced flooding frequency of wetland habitat, and stabilisation of water within wetlands which otherwise had naturally fluctuating water levels, resulting in water levels becoming too deep and inappropriate vegetation cover developing (DSEWPaC, 2013b). Inappropriate hydrological regimes pose a threat especially within the Murray Darling Basin as a result of water diversion and development for agriculture (DoEE, 2019).

Water quality declines of wetlands can impact habitat characteristics and food availability for the Australian Painted Snipe. Water quality can be impacted through lack of flushing flood flows, increased nutrient runoff, pesticide and herbicide runoff or spray drift, removal of vegetation resulting in sedimentation and turbidity, and increased salinity (DoEE, 2019).

Many of the wetlands used by the species are now degraded. This may result in the species having to expend more effort in foraging and having to increase travel between foraging and roosting areas. It is thought that declines in water quality are likely to be most detrimental to chicks (DoEE, 2019).

HUMAN DISTURBANCE OF BREEDING BIRDS

The Australian Painted Snipe has potential to be impacted by human disturbance, with breeding birds being the most vulnerable to impacts. Duck hunting (including accidental mortality, or disturbance from the noise of discharging firearms), recreational fishers and birdwatchers have potential to disturb the species. Other forms of human disturbance also include habitat trampling, and litter such as discarded fishing gear and rubbish. While human disturbance is not considered a major threat throughout the species' range, it has the potential to be locally severe if not appropriately managed (DoEE, 2019).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species. While the species had a draft Recovery Plan released for public consultation in 2020, this draft document has not been endorsed under the EPBC Act.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table **10** where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 10: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Australian Painted Snipe

Key threatening process	Threat abatement plan
Competition and land degradation by unmanaged goats	Threat abatement plan for competition and land degradation by unmanaged goats (DEWHA, 2008e)
Fire regimes that cause declines in biodiversity	There is no relevant TAP
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

Key threatening process	Threat abatement plan
Predation by feral cats	Threat abatement plan for predation by feral cats (DoE, 2015g)
Predation by the European red fox	Threat abatement plan for predation by the European red fox (DEWHA, 2008f)
Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs	Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (DoEE, 2017b)

BLACK-TAILED GODWIT (*LIMOSA LIMOSA*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Endangered, migratory
DESCRIPTION	Black-tailed Godwits are around 40 to 44 cm in length. Non-breeding birds have dark grey-brown upperparts, and a dark centre of the breast (DCCEEW, 2024h).
ECOLOGY	There are three subspecies of the Black-tailed Godwit (DCCEEW, 2024h): • *L. l islandica* – which breeds predominantly in Island and overwinters in Ireland, the UK, Spain, France, Portugal and the Netherlands • *L .l limosa* – which breeds across central Europe, Asia and Russia, and largely winters in West Africa • *L. l melanuroides* – which breeds in northern China, Mongolia, Russia and Siberia, and migrates to Asia and Australia to overwinter This assessment relates to *L. l. melanuroides*, which partly occurs in Australia. The species departs breeding grounds by late August, and arrives in north-west Australia from late August. Most individuals stay in north Australia, and some move to south or east Australia. Departure from Australia occurs after mid-April (DCCEEW, 2024h). Black-tailed Godwits eat crustaceans, insects, worms, spiders, larvae, fish eggs, frog eggs and tadpoles (DCCEEW, 2024h).
DISTRIBUTION AND HABITAT	In Australia, Black-tailed Godwits occur in all states and territories. Coastal areas support the highest densities of the species. The species occurs in higher numbers on the north coast, between Weipa and Darwin, and is typically found in small numbers elsewhere. Scattered records occur inland (DCCEEW, 2024h). Black-tailed Godwits are primarily coastal, occurring in sheltered estuaries, bays and lagoons. They also use muddy lakes and wetlands further inland. The species has been recorded in sewage treatment works and wet fields. Foraging occurs on intertidal mudflats, sandflats, saltmarshes, and beaches. Feeding occurs over the whole tidal range (DCCEEW, 2024h).
POPULATIONS	The global population of Black-tailed Godwit was estimated to be between 614,000 and 809,000 individuals in 2016 (Birdlife International, 2025). In 2020, it was estimated that the Australia population comprised 42,900 mature individuals (DCCEEW, 2024h).

THREATS	The species Conservation Advice identified the following threats (DCCEEW, 2024h):
	• Habitat loss and degradation from:
	  ○ Residential and commercial development
	  ○ Habitat loss caused by industrial aquaculture
	  ○ Large-scale agriculture
	  ○ Large dams
	• Climate change
	• Invasion of saltmarshes and mudflats by cordgrass and mangroves
	• Pollution
	• Hunting

RELEVANT PLANS AND POLICIES	Conservation Advice for *Limosa limosa* (Black-tailed godwit) (DCCEEW, 2024h)

SPECIES-SPECIFIC GUIDELINES	Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2020) EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EBBC Act listed migratory shorebird species (DoE, 2017b)
SPRAT LINK	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=863

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Black-tailed Godwit used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	All records of the species within the Study Area are considered a single population. This is because the Black-tailed Godwit occurs as a single sub-population in Australia (DCCEEW, 2024h).

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-16 for a map of records and and habitat across the Study Area.

There are 494 records from 1990 onwards of the Black-tailed Godwit within the Study Area (comprising 1,687 individuals). The species has not been recorded within the Strategic Assessment Area.

A total of 6,861.2 ha of potential habitat has been mapped within the Study Area. Of this, 24.2 ha of habitat is mapped within the Strategic Assessment Area. No habitat has been mapped within the Growth Areas.

The majority of records and areas of mapped habitat are located between Point Wilson and the Western Treatment Plant. A total of 443 records associated with 1,495 individuals have been recorded in this area.

There are 40 records (associated with 156 individuals) and areas of mapped habitat associated with the Lake Connewarre Complex. A smaller number of records (4) are located in the Moolap area.

Habitat has also been mapped along riparian corridors (including the Moorabool River, Barwon River and Limeburners Bay) and along most of the coastline in the Study Area

DETAILED OVERVIEW OF SPECIES' SUSCEPTIBILITY TO INDIRECT IMPACTS

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice for the Black-tailed Godwit identifies a range of threats to the species (DCCEEW, 2024h). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

One potential indirect impact (identified as a threat) is considered relevant to implementation of the Plan. This threat is pollution and changes to the water regime, and is discussed below. It is noted that human disturbance associated with hunting is identified as a threat in the Conservation Advice, although this threat is operating outside of Australia and is therefore not relevant to the Plan (DCCEEW, 2024h).

There are a number of additional threats to the species identified in the Conservation Advice. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Part 5.

POLLUTION AND CHANGES TO THE WATER REGIME

Changes to the water regime and pollution in habitat used by the Black-tailed Godwit for foraging and / or roosting can cause indirect loss of habitat through habitat degradation. Development in upstream areas, water diversion, and industrial aquaculture have reduced water flows and increased the inflow of nutrients, sediments and other pollutants. The species is particularly sensitive to habitat disturbance due to its high energy requirements for migration to northern breeding grounds. Further, impacts to the species habitat in one part of the East-Asian Australasian Flyway can have far-reaching consequences throughout the species migration cycle, and impacts during one stage of the annual cycle can carry over to other stages (DCCEEW, 2024h).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 8 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 11: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Black-tailed Godwit

Key threatening process	Threat abatement plan
Fire regimes that cause declines in biodiversity	There is no relevant TAP
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

COMMON GREENSHANK (*TRINGA NEBULARIA*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Endangered, migratory
DESCRIPTION	*Tringa nebularia* (Common Greenshank) is a large, and heavily built wader approximately 30 to 35 cm in length. They have a long and slightly upturned bill, with grey streaks on the forehead and neck (DCCEEW, 2024l).
ECOLOGY	The Common Greenshank is a widespread migratory shorebird. They have an extensive breeding range across the British Isles, Scandinavia, Estonia, Russia. Common Greenshanks spend the non-breeding season in Africa, Europe, Melanesia, Asia, and Australasia. The Common Greenshank arrives in Australia from August, and begin the northward migration from March onwards (DCCEEW, 2024l). The species diet comprises insects, their larvae, amphibians, small fish, crustaceans, molluscs, annelids, and occasionally rodents (DCCEEW, 2024l).
DISTRIBUTION AND HABITAT	In Australia, the Common Greenshank has the widest distribution of any shorebird that occurs in Australia, and is widespread in coastal regions. In Victoria, the Common Greenshank is found between Gippsland Lakes and Port Phillip Bay. They are also widespread west to Streaky Bay, with scattered records elsewhere on the coast (DCCEEW, 2024l). They occur in all types of wetlands. Foraging occurs at the edges of wetlands, in the shallows of waterbodies, on mudflats, and in channels. Roosting habitat is inland and on the coast, and includes estuaries, mudflats, lagoons, billabongs, swamps, sewage farms, and flooded crops (DCCEEW, 2024l).
POPULATIONS	As of 2015, the global population of the Common Greenshank was estimated to be between 440,000 to 1,500,000 individuals (Birdlife International, 2025). In 2020, the Australian population was estimated to be 23,700 mature individuals (DCCEEW, 2024l).

THREATS	The species Conservation Advice identified the following threats (DCCEEW, 2024l):
	• Habitat loss and degradation from:
	  ○ Residential and commercial development
	  ○ Large-scale agriculture
	  ○ Large dams
	• Climate change
	• Anthropogenic disturbance
	• Invasion of saltmarshes and mudflats by cordgrass and mangroves
	• Pollution
	• Hunting

RELEVANT PLANS AND POLICIES	Conservation Advice for *Tringa nebularia* (Common Greenshank) (DCCEEW, 2024l)
SPECIES-SPECIFIC GUIDELINES	Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2020) EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EBBC Act listed migratory shorebird species (DoE, 2017b)
SPRAT LINK	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=863

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for Common Greenshank used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	All records of the species within the Study Area are considered a single population. This is because the Common Greenshank occurs as a single sub-population in Australia (DCCEEW, 2024l).

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-17 for a map of records and habitat across the Study Area.

There are 2,213 records from 1990 onwards of the Common Greenshank within the Study Area (comprising 12,905 individuals). The species has not been recorded within the Strategic Assessment Area.

A total of 6,857.7 ha of potential habitat has been mapped within the Study Area. Of this, 23.6 ha of habitat is mapped within the Strategic Assessment Area. No habitat has been mapped within the Growth Areas.

The majority of records and areas of mapped habitat occur from Limeburners Bay through to the Western Treatment Plant. A total of 1,639 records, associated with 5,318 individuals have been recorded in this location.

A large number of records and areas of habitat are located in the Moolap area (332 records associated with 5,659 individuals).

The Lake Connewarre Complex is associated with a large area of mapped habitat and 214 records (associated with 1,816 individuals).

Habitat has also been mapped along riparian corridors (including the Moorabool River, Barwon River and Limeburners Bay) and along most of the coastline in the Study Area

DETAILED OVERVIEW OF SPECIES' SUSCEPTIBILITY TO INDIRECT IMPACTS

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice for the Common Greenshank identifies a range of threats to the species (DCCEEW, 2024d)]. Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Pollution and changes to the water regime
- Human disturbance

There are a number of additional threats to the species identified in the Conservation Advice. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Part 5.

POLLUTION AND CHANGES TO THE WATER REGIME

Changes to the water regime and pollution in habitat used by the Common Greenshank for foraging and / or roosting can cause indirect loss of habitat through habitat degradation. Development in upstream areas, water diversion, and industrial aquaculture have reduced water flows and increased the inflow of nutrients, sediments and other pollutants. The species is particularly sensitive to habitat disturbance due to its high energy requirements for migration to northern breeding grounds (DCCEEW, 2024b).

HUMAN DISTURBANCE

Common Greenshanks are notoriously wary, and as such may be more sensitive to disturbance than other species of shorebird. Disturbance from human activities, including recreation, fishing, and off-leash dogs in roosting or foraging habitat causes individuals to pause feeding, and may force them away from traditional sites. This may affect the species ability to complete the migration to northern breeding grounds by reducing the individuals energy and / or fat reserves (DCCEEW, 2024l).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 8 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 12: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Sharp-tailed Sandpiper

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

CURLEW SANDPIPER (*CALIDRIS FERRUGINEA*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Critically Endangered, Migratory
DESCRIPTION	*Calidris ferruginea* (Curlew Sandpiper) is 18 – 23 cm in length with a wingspan of 38 – 41 cm. They have a long black bill (DCCEEW, 2023a).
ECOLOGY	The species breeds in Arctic Siberia before migrating to the southern hemisphere. Curlew Sandpipers arrive in Australia in late August and early September. The species begins to depart Australia in March. The species feeds on worms, crustaceans, molluscs and sometimes seeds and insects. (DCCEEW, 2023a)
DISTRIBUTION AND HABITAT	In Australia, the species occurs along the coast but is also widespread inland (although in lower and variable numbers). The species uses a range of freshwater and brackish coastal and estuarine areas and inland waterbodies, where it: • Forages on mudflats and in nearby shallow water, and occasionally low, sparse vegetation Roosts around mudflats in bays, inlets, estuaries and lagoons (DCCEEW, 2023a)
POPULATIONS	The species occurs as a single population in Australia. In 2016, the estimated population in the East Asian – Australasian Flyway population size was 90,000, of which 45,500 individuals were thought to visit Australia. In 2020, the Australian population was estimated to be 40,100 (DCCEEW, 2023a).

THREATS	The species Conservation Advice has identified the following threats within Australia (DCCEEW, 2023a):
	• Human disturbance
	• Habitat loss and degradation from:
	  ○ Residential and commercial development
	  ○ Industrial aquaculture
	  ○ Invasion of saltmarshes and mudflats by cordgrass and mangroves
	  ○ Large dams
	• Climate change
	• Hunting

RELEVANT PLANS AND POLICIES	Conservation Advice *Calidris ferruginea* Curlew Sandpiper (DCCEEW, 2023a)
SPECIES-SPECIFIC GUIDELINES	Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015) EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EBBC Act listed migratory shorebird species (DoE, 2017a)
SPRAT LINK	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=856

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Curlew Sandpiper used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	Given the mobile nature of the species, all records within the Study Area are considered a single population.

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-18 for a map of records and habitat across the Study Area.

There are 2,691 records from 1990 onwards of the Curlew Sandpiper within the Study Area (comprising 125,045 individuals). Of these, one record (6 individuals) has been recorded within the last five years (in 2021). The species has not been recorded within the Strategic Assessment Area.

A total of 5,929.7 ha of potential habitat has been mapped within the Study Area. Of this, 12.4 ha is mapped within the Strategic Assessment Area. No habitat is mapped within the Growth Areas.

Mapped potential habitat and the majority of records (2,414 records, comprising 96,476 individuals) for the Curlew Sandpiper occur along the shoreline of Port Phillip Bay, from Limeburners Bay west through to the Study Area boundary in the north-east.

Mapped potential habitat and multiple records (113 records, comprising 10,983 individuals) occur at the Lake Connewarre Complex.

Mapped potential habitat and multiple records (154 records, comprising 17,563 individuals) occur in the Moolap locality.

Isolated records also occur at Lara, and at Thirteenth Beach in the south of the Study Area.

A smaller area of potential habitat not associated with records occurs in the estuarine environment of Thompson Creek in the south of the Study Area.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice for the Curlew Sandpiper identifies a range of threats to the species within Australia (DCCEEW, 2023c). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Human disturbance
- Habitat degradation from pollution and changes to the water regime

Invasive plants are also identified in the Conservation Advice as a threat to the species. However, potential indirect impacts associated with this threat are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

HUMAN DISTURBANCE

Human disturbance at foraging or roosting sites, such as recreational activities, fishing, aquaculture, and walking off-leash dogs is a threat to the species. This threat is likely to increase in the future as visitation to beaches, bays, estuaries and sandflats increases. Disturbance while foraging or roosting may cause the bird to pause feeding and move from traditional sites. This can reduce the fat and energy reserve accumulated during the non-breeding season, which may affect the individuals ability to migrate to northern breeding grounds (DCCEEW, 2023c).

HABITAT DEGRADATION FROM POLLUTION AND CHANGES TO THE WATER REGIME

Changes to the water regime and pollution in habitat used by the Sharp-tailed Sandpiper for foraging and / or roosting can cause indirect loss of habitat through habitat degradation. Residential and commercial development in upstream areas, industrial aquaculture, downstream impacts of large dams, and run off from agricultural and residential areas may result in changes to flow regimes and increased nutrients, sediments and pollutants in waterways. Migratory birds are particularly sensitive to these potential impacts due to the energy requirements for migration to northern breeding areas. (DCCEEW, 2023c).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 13 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 13: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Curlew Sandpiper

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

EASTERN CURLEW (*NUMENIUS MADAGASCARIENSIS*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Critically Endangered, Migratory
DESCRIPTION	*Numenius madagascariensis* (Eastern Curlew) is the largest migratory shorebird in the world. They are 60 – 66 cm in length, with a long neck and legs, and a very long downcurved bill (DCCEEW, 2023d).
ECOLOGY	The species breeds in Russia, Mongolia, and north-eastern China. It is thought that approximately 73 per cent of the population migrates to Australia in the non-breeding season. Individuals arrive in Australia as early as July, with the majority of birds arriving in mid-August. Migration north typically starts in late February and continues until March or April (DCCEEW, 2023d). In Australia, the species feeds on crustaceans, small molluscs and insects. The species is extremely wary and will take flight at the first sign of danger, long before other shorebirds become nervous (DCCEEW, 2023d).
DISTRIBUTION AND HABITAT	In Australia, the species is typically distributed across coastal areas and is rarely found inland. The species is found in all states and territories (DCCEEW, 2023d). The species (DCCEEW, 2023d): • Typically forages in sheltered intertidal sandflats or mudflats that are open and non-vegetated • Typically roosts during high tide periods on sandy spits, sandbars, and islets, either on sand near the high-water mark or among coastal vegetation • Is dependent on a network of suitable habitat, which includes various wetlands and freshwater lake shores
POPULATIONS	In 2022, the global population was estimated to be 20,000 – 35,000 (DCCEEW, 2023d). The Australian population of the Eastern Curlew was estimated to be 22,500 in 2020 (Birdlife International, 2025).

THREATS	The species Conservation Advice has identified the following threats within Australia (DCCEEW, 2023d):
	• Human disturbance
	• Habitat loss and degradation caused by:
	  ○ Residential and commercial development
	  ○ Industrial aquaculture
	  ○ Invasion of saltmarshes and mudflats by cordgrass and mangroves
	  ○ Large dams
	• Climate change
	• Direct mortality cause by hunting, deliberate poisoning, and fisheries-related mortalities
	• Pollution

RELEVANT PLANS AND POLICIES	Conservation Advice *Numenius madagascariensis* Eastern Curlew (DCCEEW, 2023d)
SPECIES-SPECIFIC GUIDELINES	Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015) EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EBBC Act listed migratory shorebird species (DoE, 2017a)
SPRAT LINK	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=847

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Eastern Curlew used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	Given the mobile nature of the species, all records within the Study Area are considered a single population.

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-19 for a map of records and habitat across the Study Area.

There are 94 records (187 individuals) of the Eastern Curlew within the Study Area, the most recent of which was recorded in 2018. The species has not been recorded within the Strategic Assessment Area.

A total of 5,073.8 ha of potential habitat has been mapped within the Study Area. Of this, 3.9 ha has been mapped within the Strategic Assessment Area. No habitat has been mapped within the Growth Areas.

Mapped habitat and 43 records (comprising 85 individuals) for the Eastern Curlew occur along the shoreline of Port Phillip Bay, from Limeburners Bay west through to the Study Area boundary in the north-east.

24 records (57 individuals) occur at the Lake Connewarre Complex, associated with a large area of mapped potential habitat.

26 records (44 individuals) and mapped potential habitat also occurs at the Moolap locality.

A smaller area of habitat not associated with records occurs in the estuarine environment of Thompson Creek in the south of the Study Area.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice for the Eastern Curlew identifies a range of threats to the species in Australia (DCCEEW, 2023g). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Human disturbance
- Pollution and changes to the water regime

Invasive weeds are also identified in the Conservation Advice as a threat to the species. However, potential indirect impacts associated with this threat are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

HUMAN DISTURBANCE

Human disturbance from recreation, fishing, aquaculture, and off-leash dogs is a threat to the species. Eastern Curlews are very wary, and will take flight at the sign of danger. Eastern Curlews have been recorded to take flight when humans approach within 30-100 m, or even up to 250 m. This threat is expected to increase as the level of visitation to beaches, bay, estuaries and sandflats increases (DCCEEW, 2023g).

As a migratory shorebird, the Eastern Curlew requires suitable foraging opportunities to build up energy stores required for migration. Human disturbance can interrupt the species' feeding or roosting behaviours and may cause the species not to feed or roost in a location that would otherwise provide suitable habitat (DCCEEW, 2023g).

POLLUTION AND CHANGES TO THE WATER REGIME

Pollution and changes to the water regime in habitat used by the Eastern Curlew for foraging and/or roosting can cause indirect loss of habitat for the species through habitat degradation. Residential and commercial development in upstream areas, industrial aquaculture, and run off from agricultural or residential areas can impact hydrology and increase the level of nutrients sediments and other pollutants in waterways (DCCEEW, 2023g).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 14 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 14: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Eastern Curlew

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

GREAT KNOT (*CALIDRIS TENUIROSTRIS*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Vulnerable, Migratory
DESCRIPTION	*Calidris tenuirostris* (Great Knot) is a medium sized shorebird that grows to a length of 26 – 28 cm. The species shows marked seasonal variation (DCCEEW, 2024d).
ECOLOGY	The Great Knot breeds in north-east Siberia. The species migrates to southern non-breeding grounds between August and October. Most birds stay in northern Australia, although some individuals move further south. The species leaves Australia in late March to April (DCCEEW, 2024d) The Great Knot feeds on invertebrates by jabbing the bill into mud. The species feeds on bivalves, gastropods, crustaceans and other invertebrates (DCCEEW, 2024d).
DISTRIBUTION AND HABITAT	The Great Knot breeds in the northern hemisphere and undertakes biannual migrations along the East Asian-Australasian Flyway. The species has been recorded around the entirety of the Australian coast along with a few scattered records inland. The greatest numbers have been recorded in northern Western Australia, and the Northern Territory. The species is much less common in south-west Australia, South Australia, Victoria and Tasmania. The extent of occurrence of the Australian population is estimated to be 9,600,000 km2, and the area of occupancy is 6,000 km2(DCCEEW, 2024d) While in Australia, the species forages on intertidal mudflats and sandflats. Roosting habitat includes inlets, bays, lagoons and estuaries, often close to foraging habitat (DCCEEW, 2024d)
POPULATIONS	The population using the East Asian-Australasian Flyway was estimated to be 386,900 in 2020 (DCCEEW, 2024d)

THREATS	The species Conservation Advice has identified the following threats (DCCEEW, 2024d):
	• Habitat loss and habitat degradation, through:
	  ○ Residential and commercial development
	  ○ Industrial aquaculture
	  ○ Invasion of saltmarshes and mudflats by cordgrass and mangroves
	  ○ Large dams
	• Climate change
	• Hunting
	• Pollution/contaminants
	• Human disturbance

RELEVANT PLANS AND POLICIES	Conservation Advice *Calidris tenuirostris* Great Knot (DCCEEW, 2024d)
SPECIES-SPECIFIC GUIDELINES	Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015) EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EBBC Act listed migratory shorebird species (DoE, 2017a)
SPRAT LINK	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=862

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Great Knot used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	Given the mobile nature of the species, all records within the Study Area are considered a single population.

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-20 for a map of records and habitat across the Study Area.

There are 55 records (129 individuals) of the Great Knot within the Study Area, the most recent of which was recorded in 2018. The species has not been recorded within the Strategic Assessment Area.

A total of 4,161.4 ha of potential habitat has been mapped within the Study Area. No habitat has been mapped within the Strategic Assessment Area or the Growth Areas.

Mapped habitat for the Great Knot occur along the shoreline of Port Phillip Bay, from Limeburners Bay west through to the Study Area boundary in the north-east. Records in this area (53 records, constituting 118 individuals) occur near Port Wilson.

A large area of mapped habitat and a single record (of 10 individuals) occurs at the Lake Connewarre Complex.

A smaller area of mapped habitat and a single record (of one individual) occurs at the Moolap locality.

Habitat not associated with records occurs in the estuarine environment of Thompson Creek in the south of the Study Area.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice for the Great Knot identifies a range of threats to the species (DCCEEW, 2024d). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Altered hydrological regimes and pollution
- Human disturbance

There are a number of additional threats to the species identified in the Conservation Advice. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Part 5.

ALTERED HYDROLOGICAL REGIMES AND POLLUTION

Changes to water regimes and pollution pose a threat to the Great Knot. Upstream development, industrial aquaculture, and run off from agricultural and residential areas changes water volumes and increases sediment, nutrient, and pollution loads (DCCEEW, 2024d).

HUMAN DISTURBANCE

Human disturbance of Great Knots can be associated with a range of sources, including recreational activities (such as off-leash dog walking), construction activities and fishing/harvesting (DCCEEW, 2024d).

Disturbance can cause Great Knots to pause or abandon roosting or foraging activities and may cause then to cease using areas of habitat which are otherwise suitable. As the species is a migratory bird, the Great Knot has high energy requirements to allow it to build up necessary fat stores to migrate north, and so is particularly vulnerable to disturbance (DCCEEW, 2024d).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 15where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 15: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Great Knot

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

GREATER SAND PLOVER (*CHARADRIUS LESCHENAULTII*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Vulnerable, Migratory
DESCRIPTION	*Charadrius leschenaultii* (Greater Sand Plover) is a medium sized brown and white plover. It is similar in appearance to the Lesser Sand Plover although distinctly bigger (DCCEEW, 2023b).
ECOLOGY	The Greater Sand Plover breeds in China, Mongolia and nearby parts of Russia. During the non-breeding season, the species migrates south through south-east Asia, New Guinea and over the eastern coastline of Africa (DCCEEW, 2023b). Only the subspecies *C. l. leschenaultii* occurs in Australia. Almost three quarters of the subspecies is present in Australia during the austral summer (DCCEEW, 2023b). In Australia, the species' diet mostly consists of molluscs, worms, crustaceans and insects (DCCEEW, 2023b).
DISTRIBUTION AND HABITAT	The species is widespread in Australia but more common along the north-west coast. It is found in coastal areas in every Australian state. In Victoria, it is mostly recorded from Corner Inlet, Western Port and Port Phillip Bay (DCCEEW, 2023b). While in Australia the species is almost entirely coastal. It inhabits sheltered beaches, intertidal mudflats, sandbanks, salt marshes, estuaries, coral reefs, rocky islands or platforms, tidal lagoons and dunes near the coast. They typically forage in wet ground, and roost on sand-spits or high on banks near beaches (DCCEEW, 2023b).
POPULATIONS	In 2020, the Australian population was estimated to be 126,300 individuals (DCCEEW, 2023b).

THREATS	The species Conservation Advice has identified the following threats to the species within Australia (DCCEEW, 2023b):
	• Habitat loss, fragmentation and degradation from:
	  ○ Residential and commercial development
	  ○ Industrial aquaculture
	  ○ Invasion of coastal saltmarshes and mudflats by cordgrass and mangroves
	  ○ Large dams
	• Human disturbance
	• Climate change
	• Hunting
	• Pollution and changes to the water regime

RELEVANT PLANS AND POLICIES	Conservation Advice *Charadrius leschenaultii* Greater Sand Plover (DCCEEW, 2023b)
SPECIES-SPECIFIC GUIDELINES	Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015) EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EBBC Act listed migratory shorebird species (DoE, 2017a)
SPRAT LINK	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=877

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Greater Sand Plover used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	Given the mobile nature of the species, all records within the Study Area are considered a single population.

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-21 for a map of records and habitat across the Study Area.

There are two records (3 individuals) of the Greater Sand Plover within the Study Area, recorded in 1994 and 1996. The species has not been recorded within the Strategic Assessment Area.

A total of 2,988.6 ha of potential habitat has been mapped within the Study Area. Of this, 0.5 ha has been mapped within the Strategic Assessment Area. No habitat has been mapped within the Growth Areas.

Both records and mapped habitat for the Greater Sand Plover occurs in the Moolap locality.

Otherwise, habitat is mapped along the shoreline of Port Phillip Bay, from Limeburners Bay west through to the Study Area boundary in the north-east, and at the Lake Connewarre Complex.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice identifies a range of threats to the Greater Sand Plover in Australia (DCCEEW, 2023d). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Human disturbance
- Pollution and changes to the water regime

Invasive weeds are also identified in the Conservation Advice as a threat to the species. However, potential indirect impacts associated with this threat are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

HUMAN DISTURBANCE

Human disturbance from activities such as fishing, aquaculture, dog walking and other recreational activities is a threat to the Greater Sand Plover. This threat is likely to increase as the level of visitation to beaches, sandflats, bays and estuaries increases. (DCCEEW, 2023d).

As a migratory shorebird, the Greater Sand Plover requires suitable foraging opportunities to build up energy stores required for migration. Human disturbance can interrupt the species' feeding or roosting behaviours and may cause the species not to feed or roost in a location that would otherwise provide suitable habitat (DCCEEW, 2023d).

POLLUTION AND CHANGES TO THE WATER REGIME

Pollution and changes to the water regime in habitat used by the Greater Sand Plover for foraging and/or roosting can cause indirect loss of habitat for the species through habitat degradation. Residential and commercial development upstream, industrial aquaculture, and run off from agricultural and residential areas causes changes to flow regimes and increases the level of nutrients, sediments, and other pollutants in waterways (DCCEEW, 2023d).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 16 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 16: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Greater Sand Plover

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

LATHAM'S SNIPE (*GALLINAGO HARDWICKII*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Vulnerable, migratory
DESCRIPTION	*Gallinago hardwickii* (Latham's Snipe) is a medium sized wader, 29 – 33 cm in length. They have a long, straight bill, a long tail and short legs (DCCEEW, 2024e).
ECOLOGY	Latham's Snipe breeds in Japan and far eastern Russia, and migrates to Australia to over-winter. There is a lack of records between breeding areas and Australia, which suggests that the species might fly directly to Australia. They depart breeding grounds from July to November, arriving in northern Australia from late July to early August. The migration journey probably only takes a few days. Immature birds, or birds in poor condition, may remain in Australia during the breeding season (DCCEEW, 2024e). Latham's Snipe feeds in the early morning, the evening, or at night. Their diet comprises invertebrates and plant materials (DCCEEW, 2024e).
DISTRIBUTION AND HABITAT	Most individuals of Latham's Snipe are found south of the Richmond River in NSW. While in Australia, Latham's Snipe is dispersive. They likely move in response to the availability of food, or rainfall (DCCEEW, 2024e). Latham's Snipe is typically found in dense cover of grass, sedge, lignum, reeds and rushes. Roosting habitat includes small wetlands such as saltmarshes, urban water bodies, and creek edges. They may also use pasture and crops. Foraging occurs in shallow water or soft mudflats (DCCEEW, 2024e).
POPULATIONS	The total population of Latham's Snipe was estimated to be 20,000 to 39,000 mature individuals in 2020 (Birdlife International, 2025). The Australian population was estimated to be 19,000 in 2020 (DCCEEW, 2024e).

THREATS	The species Conservation Advice identified the following threats (DCCEEW, 2024b):
	• Habitat loss and degradation from:
	  ○ Residential and commercial development
	  ○ High-intensity grazing
	• Climate change
	• Cat and fox predation
	• Broad-leaved tea-tree invasion of grassland
	• Hunting and fishing bycatch

RELEVANT PLANS AND POLICIES	Conservation Advice for Gallinago hardwickii (Latham's snipe) (DCCEEW, 2024e) Threat abatement plan for predation by feral cats (DoE, 2015g) Threat abatement plan for predation by the European red fox (DEWHA, 2008g)
SPECIES-SPECIFIC GUIDELINES	Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2020) EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EBBC Act listed migratory shorebird species (DoE, 2017b)
SPRAT LINK	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=863

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	N/A. A Habitat Importance Model (HIM) is not available for this species.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for Latham's Snipe used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	All records of the species within the Study Area are considered a single population. This is because Latham's Snipe occurs as a single sub-population in Australia (DCCEEW, 2024e).

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-22 for a map of records and habitat across the Study Area.

There are 682 records from 1990 onwards of Latham's Snipe within the Study Area (comprising 4,702 individuals). There are two records of Latham's Snipe in the Strategic Assessment Area, associated with Cowies Creek downstream of the WGGA. This portion of Cowies Creek is surrounded by the urbanised areas of North Geelong. Latham's Snipe has not been recorded within the Growth Areas.

A large number of records of Latham's Snipe occur in the Lake Connewarre Complex (66 records associated with 517 individuals) and the Moolap area (73 records associated with 920 individuals). A number of records also occur along the shoreline of Port Phillip Bay, between Limeburners Bay and the Study Area boundary in the north-east.

Based on the species habitat preferences and the distribution of records, habitat within the Study Area is likely to be associated with wetlands and catchments including the Lake Connewarre Complex, the coastline of Port Phillip Bay, Limeburners Bay, the Barwon River and Moorabool Rivers, and Cowies Creek.

DETAILED OVERVIEW OF SPECIES' SUSCEPTIBILITY TO INDIRECT IMPACTS

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice for Latham's Snipe identifies a range of threats to the species (DCCEEW, 2024e). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

One potential indirect impact (identified as a threat) is considered relevant to implementation of the Plan. This threat is changes to the water regime, and is discussed below. It is noted that human disturbance associated with hunting is identified as a threat in the Conservation Advice, although this threat is operating outside of Australia and is therefore not relevant to the Plan (DCCEEW, 2024e).

There are a number of additional threats to the species identified in the Conservation Advice. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Part 5.

CHANGES TO THE WATER REGIME

Latham's Snipe is threatened by changes to water regimes, particularly from the drainage and diversion of water from wetlands and urbanisation in coastal areas. These impacts result in the modification of sedimentation and hydrological regimes, and changes to the dynamics of chemical pollutants and nutrients which may cause the disturbance or loss of habitat for Latham's Snipe (DCCEEW, 2024e). The species is particularly sensitive to habitat disturbance due to its high energy requirements for migration to northern breeding grounds.

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 8 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 17: Relevant Key Threatening Processes and associated Threat Abatement Plans for Latham's Snipe

Key threatening process	Threat abatement plan
Fire regimes that cause declines in biodiversity	There is no relevant TAP
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP
Predation by feral cats	Threat abatement plan for predation by feral cats (DoE, 2015g)
Predation by European red fox	Threat abatement plan for predation by the European red fox (DEWHA, 2008f)

LITTLE TERN (*STERNULA ALIBFRONS*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Vulnerable, migratory
DESCRIPTION	*Sternula albifrons* (Little Tern) is a small and slender tern. It is similar in shape and size to the Fairy Tern (DCCEEW, 2025).

ECOLOGY	There are two main subpopulations of Little Tern in Australia (DCCEEW, 2025):
	• *Sternula albifrons placens* (the south-eastern subpopulation). This population breeds in south-eastern Australia and also visits New Zealand during the nonbreeding season. This subspecies is relevant to this assessment
	• *Sternula albifrons sinensis* which comprises two subpopulations:
	  ○ The northern subpopulation – which breeds in northern Australia
	  ○ An additional subpopulation which breeds in north-east Asia, and migrates to eastern Australia during the non-breeding season
	Diet mostly comprises small fish, though may also include insects, molluscs and crustaceans. Little Terns typically forage alone, or in loose small flocks. They are primarily diurnal (DCCEEW, 2025).
	Little Terns typically nest in small colonies, generally up to 50 pairs. The south-eastern subpopulation breeds from late August to February. Nests are typically a shallow scrape in the sand. They nest on banks, sand-spits, ridges or islets associated with sheltered coastal environments. They may also use artificial islets, banks, or dunes. They tend to avoid vegetated areas. A clutch of one to three eggs is laid (DCCEEW, 2025).
	Post-breeding, the south-eastern subpopulation is thought to stay near the east coast. Some birds fly to New Zealand, and some may move north (DCCEEW, 2025).

DISTRIBUTION AND HABITAT	The south-eastern subpopulation breeds in parts of Tasmania, Victoria, NSW, South Australia, and Queensland. In Victoria, breeding has been recorded in East Gippsland, and the south-western beaches of Victoria through to South Australia (DCCEEW, 2025). Little Terns occur in sheltered coastal environments, such as estuaries, lagoons, river mouths, lakes, harbours, bays and inlets. Roosting habitat includes banks, sand-spits and bars in sheltered coastal and estuarine environments, or the sandy shores of ocean beaches and lakes. Foraging occurs in shallow waters of coastal lagoons, estuaries and lakes. They also forage along open coastlines, and less often at sea (DCCEEW, 2025). The Conservation Advice for the Little Tern defines habitat critical to the survival to include all known breeding sites that have been used for nesting in the last three generations (DCCEEW, 2025).
POPULATIONS	The south-eastern subpopulation is estimated to contain 1,200 mature individuals. The population is concentrated in NSW (~598 individuals) and Queensland (~432-532 individuals). In Victoria, the current population estimate is 172 birds, based on data from Gippsland Lakes (DCCEEW, 2025).
THREATS	The Conservation Advice for the Little Tern identifies the following threats (DCCEEW, 2025): • Anthropogenic disturbance at nesting sites, particularly from off-road vehicles and off-leash dogs • Industrial and urban development • Altered hydrological regimes • Beach wrack harvesting • Invasive weeds • Predation by introduced species, and native species (such as silver gulls) • Climate change impacts such as sea-level rise and extreme natural events

	• Hybridisation with Fairy Terns
RELEVANT PLANS AND POLICIES	Conservation Advice for *Sternula albifrons* (Little Tern) (DCCEEW, 2025)
SPECIES-SPECIFIC GUIDELINES	Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2020)
SPRAT LINK	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=82849

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for Little Tern used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	All records of the species within the Study Area are considered a single population. This is because the Little Tern occurs as a single sub-population in south-eastern Australia.

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-32 for a map of records and habitat across the Study Area.

There are 681 records from 1990 onwards of Little Tern within the Study Area (comprising 3,404 individuals). The species has not been recorded within the Strategic Assessment Area.

A large number of records are located in the Werribee / Avalon area (576 records associated with 2,319 individuals). A lesser number of records are associated with Moolap (26 records), Avalon (58 records) and Lake Connewarre (10 records).

Modelled habitat for the species within the Study Area is associated with hydrological features, including the shoreline of Port Phillip Bay, the Barwon River, and Lake Connewarre.

DETAILED OVERVIEW OF SPECIES' SUSCEPTIBILITY TO INDIRECT IMPACTS

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice for Little Tern identifies a range of threats to the species (DCCEEW, 2025). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

One potential indirect impact (identified as a threat) is considered relevant to implementation of the Plan. This threat is altered hydrological regimes, and is discussed below. It is noted that human disturbance at nesting sites is identified as a threat in the Conservation Advice. Given that in Victoria, the species nests in Gippsland and the south-west, this threat is not relevant to the Plan (DCCEEW, 2025).

There are a number of additional threats to the species identified in the Conservation Advice. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Part 5.

ALTERED HYDROLOGICAL REGIMES

Little Tern is threatened by altered hydrological regimes. Changes to estuarine morphology and hydrology, water quality, or salinity levels may lead to the loss of breeding or roosting habitat, or affect the availability and quality of food resources (DCCEEW, 2025).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 8 where they relate to:

- The potential direct impacts of the Plan, or

- The relevant indirect impacts

Table 18: Relevant Key Threatening Processes and associated Threat Abatement Plans for Little Tern

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP
Predation by feral cats	Threat abatement plan for predation by feral cats (DoE, 2015g)
Predation by European red fox	Threat abatement plan for predation by the European red fox (DEWHA, 2008f)

LESSER SAND PLOVER (*CHARADRIUS MONGOLUS*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Endangered, Migratory
DESCRIPTION	*Charadrius mongolus* (Lesser Sand Plover) is a small to medium shorebird, 18 – 21 cm in length. The body is grey-brown and white, and the sexes differ in breeding plumage. While the species is in Australia, it is in non-breeding plumage and is often difficult to distinguish from *Charadrius mongolus* (Greater Sand Plover) (TSSC, 2016b).
ECOLOGY	The Lesser Sand Plover breeds in the northern hemisphere and undertakes annual migrations to and from southern feeding grounds. It has a generational time of 8 years, with a maximum longevity of 12.6 years (TSSC, 2016b). The species occurs in small to large flocks, often with greater than 100 individuals. During the non-breeding season, the species diet is comprised of insects, crustaceans, molluscs and polychaete worms (TSSC, 2016b).
DISTRIBUTION AND HABITAT	Four of the five subspecies occur in the East Asian-Australasian Flyway, of these, two occur in Australia during the non-breeding season including *Charadrius mongolus* subsp. *mongolus*, and *Charadrius mongolus* subsp. *stegmanni* (TSSC, 2016b). Within Australia, the Lesser Sand Plover is widespread in coastal regions, and the species has been recorded in all states. It mostly occurs in northern and eastern Australia, in south-eastern parts of the Gulf of Carpentaria, western Cape York Peninsula, and islands in the Torres Strait, and along the entire east coast of Australia, where it is most abundant in Queensland and New South Wales (TSSC, 2016b). During the non-breeding season, the Lesser Sand Plover is almost strictly coastal and prefers sandy beaches, mudflats of coastal bays and estuaries, sand flats and dunes near the coast, and occasionally mangrove mudflats. Feeding habitat is primarily comprised of intertidal sandflats and mudflats in estuaries or beaches or in shallow ponds. Occasional foraging also occurs on coral reefs, along sandy or muddy river margins, and in muddy areas around lakes and bores. The Lesser Sand Plover roosts on beaches, banks, spits and banks of sand or shells (TSSC, 2016b).
POPULATIONS	The most recent population estimate of the species present in the East Asian-Australasian Flyway is 180,000 – 275,000 (Hansen *et al.*, 2016).
THREATS	The species Conservation Advice identifies the following threats in Australia (TSSC, 2016b): • Ongoing human disturbance • Pollution and changes to the water regime • Invasive plants
RELEVANT PLANS AND POLICIES	Conservation Advice *Charadrius mongolus* Lesser Sand Plover (TSSC, 2016b) Threat abatement plan for predation by the European red fox (DEWHA, 2008f)
SPECIES-SPECIFIC GUIDELINES	Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015) EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EBBC Act listed migratory shorebird species (DoE, 2017)
SPRAT LINK	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=879

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Lesser Sand Plover used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	Given the mobile nature of the species, all records within the Study Area are considered a single population.

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-23 for a map of records and habitat across the Study Area.

There are four records (four individuals) of the Lesser Sand Plover within the Study Area. The most recent was recorded in 2008, and the remainder were recorded between 1991 and 1996. The species has not been recorded within the Strategic Assessment Area.

A total of 4,468.6 ha of potential habitat has been mapped within the Study Area. Of this, 2.2 ha has been mapped within the Strategic Assessment Area. No habitat has been mapped within the Growth Areas.

Mapped habitat for the Lesser Sand Plover occurs along the shoreline of Port Phillip Bay, from Limeburners Bay west through to the Study Area boundary in the north-east. A single record (of one individual) occurs in the Port Wilson area.

Three records (three individuals) and mapped habitat also occur in the Moolap locality.

Mapped habitat not associated with records occurs at the Lake Connewarre Complex and in the estuarine environment of Thompson Creek in the south of the Study Area.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice for the Lesser Sand Plover identifies a range of threats to the species in Australia (TSSC, 2016b). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Ongoing human disturbance
- Pollution and changes to the water regime

Invasive weeds are also identified in the Conservation Advice as a threat to the species. However, potential indirect impacts associated with this threat are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

ONGOING HUMAN DISTURBANCE

Disturbance may result from recreational activities such as fishing, boating, dog walking (particularly unleashed dogs), four-wheel driving, jet skiing, noise, and lighting. While an individual source of disturbance may have a low impact, it is important to consider the cumulative impact of different types of human disturbance on the species (TSSC, 2016b).

As a migratory shorebird, the Lesser Sand Plover requires suitable foraging opportunities to build up energy stores required for migration. Human disturbance can interrupt the species' feeding or roosting behaviours and may cause the species not to feed or roost in a location that would otherwise provide suitable habitat. Disturbance can also reduce the time the species has available for foraging and resting and increase the time the species spends engaging in vigilance and anti-predator behaviour (TSSC, 2016b).

POLLUTION AND CHANGES TO THE WATER REGIME

Pollution and changes to the water regime in habitat used by the Lesser Sand Plover for foraging and/or roosting can cause indirect loss of habitat for the species through habitat degradation. The species is particularly sensitive to impacts due to its high site fidelity, tendency to aggregate, high energy demands required for migration and requirement for a network of foraging and roosting habitats. It is also noted that some sites remain important throughout the year for juveniles who may stay in Australia until maturity is reached (TSSC, 2016b).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 19 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 19: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Lesser Sand Plover

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP
Predation by European red fox	Threat abatement plan for predation by the European red fox (DEWHA, 2008f)

ORANGE-BELLIED PARROT (*NEOPHEMA CHRYSOGASTER*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Critically Endangered
DESCRIPTION	The Orange-Bellied Parrot (*Neophema chrysogaster*) is a small parrot that grows to approximately 21 cm in length and weighs about 45 – 50 grams. The upper body is bright green, and the under body is light green to bright yellow with an orange patch on the belly (TSSC, 2006).
ECOLOGY	The Orange-bellied Parrot migrates yearly from its breeding sites in south-western Tasmania north to the mainland. Breeding occurs between November and March, and overwintering occurs between April and October (DELWP, 2016). The species has demonstrated low lifespan and survival rates. The mean lifespan was observed at 2.22 years between 1990 and 1999, and a decline in lifespan may have occurred during this period. Annual survival averaged at 56 per cent for juveniles and 65 per cent for adults between 1990 and 2006, with substantial inter-annual variation (DELWP, 2016). Birds can nest in natural hollows or artificial nests. Females produce 4 – 6 eggs with most nests producing fledglings. Pairs produce one brood in a breeding season, though not all females will breed in all years. The reason for this is not known, though may relate to the body condition of females in the beginning of the breeding season (DELWP, 2016). The Orange-Bellied Parrot forages on the ground or in low vegetation, usually less than 1 m above the ground. The species typically forages in pairs or singly during the breeding season, and in small flocks during the non-breeding seasons. Single birds have often been recorded feeding with other species, including *Neophema chrysostoma* (Blue-winged Parrot) (TSSC, 2006). On the mainland, the species feeds on a range of food plants, including some introduced species, and occasionally in irrigated crops. Food plant species appear to have become narrower in recent decades. Food availability changes throughout winter as different plants set seed at different times, and food at some sites may become temporarily unavailable due to inundation in closed wetland and estuary systems. It is therefore likely that the species requires a range of winter feeding locations and a wide variety of food plant species to sustain them (DELWP, 2016). During winter, the species appears to be semi-nomadic – moving between food sources and locations. This is likely in response to changing availability of food sources, and the species appears to avoid areas with high levels of disturbance and human development (DELWP, 2016).
DISTRIBUTION AND HABITAT	***DISTRIBUTION*** The Orange-bellied Parrot is endemic to south-eastern Australia. The species migrates between distinct breeding and non-breeding ranges. Breeding occurs in south-west Tasmania and overwintering occurs on the south-east coast of mainland Australia (DELWP, 2016). Non-breeding birds are found along the coast of Victoria and South Australia, and occasionally in NSW(although sightings in NSW are now very rare) (DELWP, 2016). The mainland distribution covers approximately 1,000 km of coastline from the mouth of the Murray River in SA to east of Jack Smith Lake in Victoria. The most common overwintering sites include the Bellarine Peninsula at Port Phillip Bay, Victoria, and Carpenter Rocks in South Australia (TSSC, 2006). ***HABITAT*** During the non-breeding season, the species forages in low shrubs or prostrate vegetation 10 km of the coast. When migrating, the Orange-bellied Parrot is found in locations associated with saltmarshes and adjacent pastures that are close to free-standing water bodes. It is likely that the species requires a range of winter feeding locations in different catchments, at different elevations and with a variety of food plant species to sustain them throughout winter. Roosting occurs in

	dense shrubs within a few kilometres of foraging sites. The species may roost in introduced plant species such as *Lycium ferocissum* (African Boxthorn) (DELWP, 2016). ***HABITAT CRITICAL TO SURVIVAL*** Further mapping is required to identify and map habitat critical to the survival of the species on the mainland. The Recovery Plan notes that it requires a diversity of foraging opportunities, in saltmarshes, dunes and adjacent shrubby areas and weedy pastures, within 10 km from the coast and 200 m of coastal wetlands and waterbodies, but more than 2 km from developed areas such as towns. Non-breeding habitat is required at several locations throughout the mainland range to support migration and local movements of the species which exploit fluctuating food sources during winter (DELWP, 2016). Because the wild population is small and difficult to detect, at a minimum, all non-breeding locations occupied since the year 2000 are considered essential for the survival of the species. Other locations are likely to become important as the population expands (DELWP, 2016).
POPULATIONS	Until 1920 the Orange-bellied Parrot was reported as common or locally abundant. The species has experienced a significant reduction in abundance since that time (TSSC, 2006). 70 adult Orange-bellied Parrots were recorded returning to breeding grounds in Melaleuca (in Tasmania) at the beginning of the 2021/22 breeding season (Birdlife Australia, 2022). This was a significant increase from previous years where approximately 50 individuals were recorded. Genetic analysis suggests the wild population has suffered a significant genetic decline. Further genetic declines are predicted to occur due to the continued decline of the species and current very low population size (DELWP, 2016). As of May 2022, there are over 500 Orange-bellied Parrots in captivity (Birdlife Australia, 2022). Breeding success is lower in the captive populations than in the wild. The captive population has produced a strongly female biased sex ratio (approximately 30 per cent male), the cause of this is unknown. This population is intended to serve as both an insurance population if extinction occurs in the wild, and a source population for release of captive-bred birds to the wild (DELWP, 2016). However, the survival rate of captive-bred Orange-bellied Parrots released into the wild is low. Recent research has found that the wing shape of captive-bred birds are different to those of wild birds, which may make captive-bred birds less able to successfully migrate long distances. It is possible that altered wing shape may contribute to low observed survival of captive-bred birds (Stojanovic *et al.*, 2021).

THREATS	The Recovery Plan has identified the following threats (DELWP, 2016):
	• Degradation and loss of habitat, including:
	  ○ Development and land use change
	  ○ Inappropriate hydrological regimes
	  ○ Inappropriate grazing regimes
	  ○ Inappropriate fire regimes within the species' breeding range
	  ○ Invasive weeds
	• Loss of genetic diversity and inbreeding
	• Disease (specifically Psittacine Beak and Feather Disease)
	• Stochastic environmental events (such as major fires within the breeding range, catastrophic weather events, storms during migration, or fires/storms at breeding institutions which house the captive breeding population)
	• Climate change
	• Predators and competitors
	• Barriers to migration and movement
	• Consumption of toxic food plants
	• Hybridisation with Blue-winged Parrots
	• Potentially negative outcomes from unforeseen impacts from land management activities
	
	A recent study found that knowledge of the key threatening processes remains lacking, and that recently used approaches of focusing conservation efforts within the species' breeding range alone

	are insufficient to halt its decline. The paper emphasises that mortality rates of migrating and wintering populations must also be targeted for conservation actions to prevent the species' extinction (Stojanovic *et al.*, 2020).
RELEVANT PLANS AND POLICIES	Commonwealth Listing Advice on *Neophema chrysogaster* (TSSC, 2006) National Recovery Plan for the Orange-bellied Parrot, *Neophema chrysogaster* (DELWP, 2016) Threat abatement plan for competition and land degradation by rabbits (DoEE, 2016) Threat abatement plan for predation by feral cats (DoE, 2015g) Threat abatement plan for predation by the European red fox (DEWHA, 2008f)
SPECIES-SPECIFIC GUIDELINES	Survey Guidelines for Australia's Threatened Birds. EPBC Act survey guidelines 6.2 (DEWHA, 2010b)
SPRAT LINK	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=747

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE GROWTH AREAS**
	There is no habitat for the Orange-bellied Parrot within the growth areas.
	OUTSIDE THE GROWTH AREAS
	Habitat mapping across the broader Strategic Assessment Area and Study Area was based on the Orange-bellied Parrot HIM prepared by DELWP [insert ref].
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA. The records were filtered to remove records prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for Orange-bellied Parrot used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	All records of the Orange-bellied Parrot are considered part of the same population.

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment.

See Map 19-24 for a map of records and habitat across the Study Area.

There are 200 records (1,629 individuals) of the Orange-bellied Parrot within the Study Area. The most recent was recorded in 2020. The species has not been recorded within the Strategic Assessment Area.

A total of 4,711.4 ha of potential habitat has been mapped within the Study Area. Of this, 2.8 ha occurs within the Strategic Assessment Area. No habitat has been mapped within the Growth Areas.

Mapped habitat and a large number of records (159 records, constituting 1,011 individuals) for the Orange-bellied Parrot occur along the shoreline of Port Phillip Bay, from Limeburners Bay west through to the Study Area boundary in the north-east. Records in this area are not hydrologically connected to the Growth Areas.

Mapped habitat and 41 records (constituting 618 individuals) occur at the Lake Connewarre Complex. This area is downstream of parts of the NGGA and the WGGA.

Habitat not associated with records is located at Moolap and at the estuarine environment of Thompson Creek in the south of the Study Area.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Recovery Plan for the Orange-bellied Parrot identifies a range of threats to the species (DELWP, 2016). Where these threats are relevant to the implementation of the Plan, the Plan includes management strategies to mitigate their impacts. Where these threats are present in the Study Area and have the potential to be exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts. The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Inappropriate hydrological regimes

There are a wide range of additional key threats which are identified. However, these are not considered relevant to implementation of the Plan as the Plan is unlikely to exacerbate the risk across the Study Area. These threats are (DELWP, 2016):

- Invasive weeds
- Predation by cats
- Inappropriate grazing regimes
- Inappropriate fire regimes within the species' breeding range
- Loss of genetic diversity and inbreeding
- Disease (specifically Psittacine Beak and Feather Disease)

- Stochastic environmental events (such as major fires within the breeding range, catastrophic weather events, storms during migration, or fires/storms at breeding institutions which house the captive breeding population)
- Predation by a rats, foxes and raptors in the non-breeding range
- Predation by a wide range of predators within the breeding range
- Competition for food and nest sites within the breeding range
- Potential barriers to migration and movement (such as wind turbines, powerlines and associated infrastructure, aircraft, and illuminated structures and illuminated boats). Barriers to migration for such a wide-ranging species may include barriers where a species may be killed through collision (such as wind turbines), or barriers where infrastructure results in behaviour modification and avoidance of habitat by the species
- Consumption of toxic plants
- Hybridisation with Blue-winged Parrots
- Potentially negative outcomes from unforeseen impacts from land management activities

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Part 5.

INAPPROPRIATE HYDROLOGICAL REGIMES

Hydrological regimes have the potential to be altered in multiple ways within the species' range, in a manner which negatively impacts the species. Some of the mechanisms which cause changes to hydrological regimes will not be exacerbated under the Plan and therefore are not considered further. These include water extraction and artificial estuary management practices (DELWP, 2016).

Inappropriate drainage and increased stormwater runoff from developed areas are mechanisms which can result in changes to hydrological regimes which have potential to be impacted under the Plan. These mechanisms can result in changes to the volume and timing of freshwater inflows into saline environments through increased stormwater drainage in the catchment. This, in turn, can alter the floristic composition of habitat for the Orange-bellied Parrot (DELWP, 2016).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

In accordance with Section 146K of the EPBC Act, this section considers whether the implementation of the Plan is not inconsistent with the species' Recovery Plan. It considers two questions:

- Does the Plan prevent achievement of the objectives of the Recovery Plan?
- Does the Plan prevent implementation of the Recovery Plan actions?

These questions are discussed below.

DOES THE PLAN PREVENT ACHIEVEMENT OF THE OBJECTIVES OF THE RECOVERY PLAN?

The Recovery Plan for the Orange-bellied Parrot has three primary objectives, supported by a fourth objective which is essential in order to achieve the three primary objectives. Each of these key objectives is supported by a series of strategies (DELWP, 2016):

- Objective 1: To achieve a stable or increasing population in the wild within five years
  - Strategy 1: Increase breeding output in the wild
  - Strategy 2: Increase survival in the wild
  - Strategy 3: Maintain wild behaviours
- Objective 2: To increase the capacity of the captive population, both to support future releases of captive-bred birds to the wild and to provide a secure long-term insurance population

- Strategy 4: Increase the size of the captive population as quickly as possible
- Strategy 5: Manage genetics of the captive population
- Strategy 6: Manage the wild and captive populations as a metapopulation

- Objective 3: To protect and enhance habitat to maintain, and support growth of, the wild population
  - Strategy 7: Maintain the extent of habitat throughout the breeding and non-breeding range
  - Strategy 8: Increase the extent of high quality of habitat throughout the breeding and non-breeding range
- Objective 4: To ensure effective adaptive implementation of the [recovery] plan
  - Strategy 9: Obtain and analyse key information required to measure and improve implementation to achieve the primary objectives
  - Strategy 10: Employ sound procedures for managing, reviewing and reporting on progress to ensure effective adaptive management
  - Strategy 11: Secure delivery partners and sufficient funding to ensure very high and high priority actions are implemented
  - Strategy 12: Foster and maintain relationships with key individuals, organisations and the broader community

It is also recognised that each of the strategies of the Recovery Plan has a detailed series of associated performance criteria against which the success of the Recovery Plan will be measured (DELWP, 2016). The Plan will not prevent the achievement of any of the performance criteria.

Overall, the outcome under the Plan for the Orange-bellied Parrot will not prevent the achievement of any of the objectives or associated strategies of the Recovery Plan.

DOES THE PLAN PREVENT IMPLEMENTATION OF THE RECOVERY PLAN ACTIONS?

The Recovery Plan identifies a set of actions in order to deliver on the objectives (DELWP, 2016). The Plan will not prevent the implementation of any of these actions.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 20 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 20: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Orange-bellied Parrot

Key threatening process	Threat abatement plan
Competition and land degradation by rabbits	Threat abatement plan for competition and land degradation by rabbits (DoEE, 2016)
Fire regimes that cause declines in biodiversity	There is no relevant TAP
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP
Predation by feral cats	Threat abatement plan for predation by feral cats (DoE, 2015g)
Predation by the European red fox	Threat abatement plan for predation by the European red fox (DEWHA, 2008f)
Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species	There is no relevant TAP

RED KNOT (*CALIDRIS CANUTUS*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Vulnerable, Migratory
DESCRIPTION	*Calidris canutus* (Red Knot) is a small to medium migratory shorebird. It has a length of 23-25 cm, a wingspan of 45-54 cm (DCCEEW, 2024c).
ECOLOGY	There are six recognised subspecies of the Red Knot, of which two spend winter in Australia: • *Calidris canutus piersmai* regularly occurs in Australia, almost exclusively in the north-west • *C. c. rogersi* regularly occurs in Australia, mostly in the east These species are considered together as the Australian population. The species breeds at a range of locations around the Arctic. *C. c. rogersi* breeds in north-east Siberia, and mostly migrates to New Zealand and Australia. *C. c. piersmai* breeds in the north of Russia, and migrates along the coast of eastern Asia. Individuals typically arrive in Australia from late August. The species returns to the northern hemisphere between February and May. In Australia, the species feeds primarily on intertidal invertebrates including molluscs, insects, crustaceans and worms. (DCCEEW, 2024c)
DISTRIBUTION AND HABITAT	The species occurs around the entire coastline of Australia. However, it is less numerous in south-western Australia and very large numbers occur in north-west Australia. The species mainly inhabits coastal environments and occasionally saline wetlands near the coast The species: • Usually forages on intertidal mudflats, sandflats, and sandy beaches. Activity is regulated by the tide, and individuals follow the edge of the tide to feed • Roosts on intertidal mudflats, non-tidal swamps, lakes and lagoons near the coast. The species prefers roosting habitat in open areas away from potential cover for predators, but close to foraging areas (DCCEEW, 2024c)
POPULATIONS	The global population of the Red Knot was estimated at 110,000 in 2016, with 68,900 individuals occurring in Australia. In 2020, the Australian population was estimated at 64,700 individuals (DCCEEW, 2024c).

THREATS	The species Conservation Advice has identified the following threats (DCCEEW, 2024c):
	• Habitat loss and habitat degradation caused by:
	  ○ Residential and commercial development
	  ○ Industrial aquaculture
	  ○ Invasion of coastal saltmarsh and mudflats by cordgrass and mangroves
	  ○ Large dams
	• Climate change
	• Hunting
	• Pollution and contamination
	• Human disturbance

RELEVANT PLANS AND POLICIES	Conservation Advice for *Calidris canutus* (Red Knot) (DCCEEW, 2024c)

SPECIES-SPECIFIC GUIDELINES	Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015) EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EBBC Act listed migratory shorebird species (DoE, 2017)
SPRAT LINK	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=855

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Red Knot used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	Given the mobile nature of the species, all records within the Study Area are considered a single population.

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-25 for a map of records and habitat across the Study Area.

A total of 4,364.5 ha of potential habitat has been mapped within the Study Area. Of this, 5.6 ha occurs within the Strategic Assessment Area. No habitat has been mapped within the Growth Areas.

There are 467 records (2,546 individuals) of the Red Knot within the Study Area, the most recent of which was recorded in 2020. The species has not been recorded within the Strategic Assessment Area.

Mapped habitat and the majority of records (445 records, constituting 2,417 individuals) for the Red Knot occur along the shoreline of Port Phillip Bay, from Limeburners Bay west through to the Study Area boundary in the north-east.

Mapped habitat and a smaller number of records (8 records, constituting 31 individuals) occur in the Moolap locality.

14 records (98 individuals) and mapped habitat also occur at the Lake Connewarre Complex.

Habitat not associated with records occurs in the estuarine environment of Thompson Creek in the south of the Study Area.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice for the Red Knot identifies a range of threats to the species (DCCEEW, 2024c). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Human disturbance
- Water pollution and changes to hydrological regimes

There are a number of additional threats to the species identified in the Conservation Advice. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Part 5.

HUMAN DISTURBANCE

Disturbance from fishing, dog walking, aquaculture, and other recreational activities is a threat to the Red Knot. This threat is likely to increase as visitation to beaches, estuaries, bays, and sandflats increases (DCCEEW, 2024c).

As a migratory shorebird, the Red Knot requires suitable foraging opportunities to build up energy stores required for migration. Human disturbance can interrupt the species' feeding or roosting behaviours and may cause the species not to feed or roost in a location that would otherwise provide suitable habitat (DCCEEW, 2024c).

WATER POLLUTION AND CHANGES TO HYDROLOGICAL REGIMES

The Red Knot has specialised feeding techniques and is susceptible to slight changes in prey sources and foraging environments. Changes to water regimes and water pollution can result in habitat degradation which can affect the suitability of habitat for the Red Knot. Upstream residential and commercial development, industrial aquaculture, and run off from residential and agricultural areas may cause changes to flow regimes and increases the level of nutrients, sediments and other pollutants in waterways (DCCEEW, 2024c).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 21 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 21: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Red Knot

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

SHARP-TAILED SANDPIPER (*CALIDRIS ACUMINATA*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Vulnerable, migratory
DESCRIPTION	*Calidris acuminata* (Sharp-tailed Sandpiper) is a small to medium sandpiper approximately 17 to 22 cm long. They have a pot-belly and a small, flat head (DCCEEW, 2024a).
ECOLOGY	Sharp-tailed Sandpipers breed in northern Siberia. They depart breeding grounds from late June, and arrive in Australia from mid-August. Larger numbers arrive in Australia in early September (DCCEEW, 2024a). Greater than 90 per cent of the global population overwinters in Australia (Birdlife International, 2025). Sharp-tailed Sandpipers feed on worms, seeds, molluscs, insects and crustaceans (DCCEEW, 2024a).
DISTRIBUTION AND HABITAT	The species occurs in all states of Australia, though is mostly found in the south-east. They are widespread both inland and on the coast. In Victoria, the species is widespread in most regions, especially in coastal areas (DCCEEW, 2024a). Sharp-tailed Sandpipers use both saline and freshwater habitats. Foraging occurs on the edge of water in wetlands (coastal and inland), mudflats, and sewage ponds. Roosting habitat includes sandy and rocky beaches, inland saltwater habitats, and freshwater habitats (DCCEEW, 2024a).
POPULATIONS	The global population is estimated to be between 60,000 to 120,000 mature individuals, with a best estimate of 73,000 (Birdlife International, 2025). In 2020, the Australian population was estimated to be 72,900 mature individuals (DCCEEW, 2024a).

THREATS	The species Conservation Advice identifies the following threats (DCCEEW, 2024a):
	• Habitat loss and degradation from:
	  ○ Residential and commercial development
	  ○ Industrial aquaculture
	  ○ Large-scale agriculture
	  ○ Large dams
	• Climate change
	• Invasion of saltmarshes and mudflats by cordgrass and mangroves
	• Pollution
	• Human disturbance
	• Hunting and fishing bycatch

RELEVANT PLANS AND POLICIES	Conservation Advice for *Calidris acuminata* (sharp-tailed sandpiper) (DCCEEW, 2024a) Threat abatement plan for predation by feral cats (DoE, 2015)
SPECIES-SPECIFIC GUIDELINES	Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2020) EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EBBC Act listed migratory shorebird species (DoE, 2017)
SPRAT LINK	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=874

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	N/A. A Habitat Importance Model (HIM) is not available for this species.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Sharp-tailed Sandpiper used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	All records of the species within the Study Area are considered a single population. This is because the Sharp-tailed Sandpiper occurs as a single sub-population in Australia (DCCEEW, 2024a).

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-26 for a map of records across the Study Area.

There are 917 records from 1990 onwards of the Sharp-tailed Sandpiper within the Study Area (comprising 57,405 individuals). The species has not been recorded within the Strategic Assessment Area.

A large number of records occur along the coastline of Port Phillip Bay, from Limeburners Bay through to the Study Area boundary in the north-east. 556 records, with an associated count of 25,423 individuals, have been recorded in this area.

There are 188 records (comprising 8,219 individuals) in the Lake Connewarre Complex. A further 146 records (comprising 23,528 individuals) have been recorded in the Moolap area.

Based on the species habitat preferences and the distribution of records, habitat within the Study Area is likely to be associated with wetlands and catchments including the Lake Connewarre Complex, the coastline of Port Phillip Bay and Limeburners Bay.

DETAILED OVERVIEW OF SPECIES' SUSCEPTIBILITY TO INDIRECT IMPACTS

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice for the Sharp-tailed Sandpiper identifies a range of threats to the species (DCCEEW, 2024d)]. Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Pollution and changes to the water regime
- Human disturbance

There are a number of additional threats to the species identified in the Conservation Advice. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Part 5.

POLLUTION AND CHANGES TO THE WATER REGIME

Changes to the water regime and pollution in habitat used by the Sharp-tailed Sandpiper for foraging and / or roosting can cause indirect loss of habitat through habitat degradation. Development in upstream areas, water diversion, and industrial aquaculture have reduced water flows and increased the inflow of nutrients, sediments and other pollutants. The species is particularly sensitive to habitat disturbance due to its high energy requirements for migration to northern breeding grounds. Further, impacts to the species habitat in one part of the East-Asian Australasian Flyway can have far-reaching consequences throughout the species migration cycle, and impacts during one stage of the annual cycle can carry over to other stages (DCCEEW, 2024a).

HUMAN DISTURBANCE

The Sharp-tailed Sandpiper is threatened by human disturbance from recreation activities such as walking, off-leash dogs, and beach driving, hunting, and fishing bycatch. It is not that the Conservation Advice identifies hunting and fishing bycatch as largely occurring outside of Australia (DCCEEW, 2024a).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 8 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 22: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Sharp-tailed Sandpiper

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

WESTERN ALASKAN BAR-TAILED GODWIT *(LIMOSA LAPPONICA BAUERI)*

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Endangered, Migratory (as *Limosa lapponica*)
DESCRIPTION	*Limosa lapponica baueri* (Bar-tailed Godwit) is a large migratory bird 37 – 39 cm in length. They have a wingspan of 250 to 450 g. Plumage varies seasonally (DCCEEW, 2024g).
ECOLOGY	Three subspecies of *L. lapponica* regularly occur in Australia: • In the non-breeding season, *L. l. baueri* (listed as migratory and vulnerable) occurs along the north and east coasts of Australia • *L. l. menzbieri* (listed as migratory and critically endangered) occurs predominately in Western Australia • *L. l. ananadryensis* is a newly recognised subspecies which occurs in north-western Australia This assessment considers impacts to *L. lapponica baueri*. The subspecies breeds in north-east Siberia and Alaska before migrating through the Yellow Sea to Australia and New Zealand (DCCEEW, 2024g). The Bar-tailed Godwit has one of the longest non-stop migratory routes recorded for any bird. The species feeds on worms, molluscs, crustaceans, insects and some plant material (DCCEEW, 2024g).
DISTRIBUTION AND HABITAT	In Australia, the species (DCCEEW, 2024g): • Mainly occurs along the north and east coasts • Typically forages in tidal estuaries and harbours • Typically roosts on banks, sandflats and spits, and sometimes in estuaries, mudflats coastal lagoons and bays
POPULATIONS	The global population of Limosa lapponica (at a species level) has been estimated to be between 1,099,000 – 1,149,000 individuals (Birdlife International, 2025). In 2020, the estimated Australian population was 41,500 individuals (DCCEEW, 2024g)

THREATS	The species Conservation Advice has identified the following threats to the species within Australia (DCCEEW, 2024g):
	• Human disturbance
	• Habitat loss and degradation from:
	  ○ Residential and commercial development
	  ○ Industrial aquaculture
	  ○ Invasion of saltmarshes and mudflats by cordgrass and mangroves
	• Climate change
	• Hunting
	• Pollution

RELEVANT PLANS AND POLICIES	Conservation Advice *Limosa lapponica baueri* Bar-tailed Godwit (Western Alaskan) (DCCEEW, 2024g)
SPECIES-SPECIFIC GUIDELINES	There are no species-specific guidelines for this species.
SPRAT LINK	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=86380

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	N/A. Surveys conducted within the Growth Areas concluded that there is unlikely to be suitable habitat present for this species.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	There is no modelled habitat available for this species. As a proxy, the modelling for a wader with similar habitat use, the Curlew Sandpiper, has been used to indicate the potential habitat occurrence and distribution for the Western Alaskan Bar-tailed Godwit across the Study Area. The habitat mapping method for the Curlew Sandpiper is as follows: Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Bar-tailed Godwit used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	Given the mobile nature of the species, all records within the Study Area are considered a single population.

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-27 for a map of records and habitat across the Study Area.

There are 149 records (1,158 individuals) of the Western Alaskan Bar-tailed Godwit within the Study Area, with the most record from 2019. The species has not been recorded within the Strategic Assessment Area.

A total of 5,929.7 ha of potential habitat has been mapped within the Study Area. Of this, 12.4 ha is mapped within the Strategic Assessment Area. No habitat is mapped within the Growth Areas.

Mapped potential habitat and 122 records (801 individuals) for the Western Alaskan Bar-tailed Godwit are located along the shoreline of Port Phillip Bay, from Limeburners Bay west through to the Study Area boundary in the north-east.

Mapped potential habitat and records are also located at the Lake Connewarre Complex (19 records, 240 individuals) and at Moolap (8 records, 117 individuals).

A smaller area of potential habitat not associated with records occurs in the estuarine environment of Thompson Creek in the south of the Study Area.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice for the Bar-tailed Godwit identifies a range of threats to the species in Australia (DCCEEW, 2024g). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Human disturbance
- Pollution and changes to the water regime

Invasive weeds are also identified in the Conservation Advice as a threat to the species. However, potential indirect impacts associated with this threat are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

HUMAN DISTURBANCE

Disturbance from fishing, dog walking (particularly unleashed dogs), aquaculture and other recreational activities is a threat to the Bar-tailed Godwit. This threat is likely to increase as the level of visitation to beaches, estuaries, bays and sandflats is (DCCEEW, 2024g).

As a migratory shorebird, the Bar-tailed Godwit requires suitable foraging opportunities to build up energy stores required for migration. Human disturbance can interrupt the species' feeding or roosting behaviours and may cause the species not to feed or roost in a location that would otherwise provide suitable habitat (DCCEEW, 2024g).

POLLUTION AND CHANGES TO THE WATER REGIME

Pollution and changes to the water regime in habitat used by the Bar-tailed Godwit for foraging and/or roosting can cause indirect loss of habitat for the species through habitat degradation. Upstream residential and commercial development, industrial aquaculture, and run off from agricultural and residential areas may cause changes in flow regimes, and increase the level of nutrients, sediments and pollutants in waterways. Impacts to the availability and quality of habitat in one part of the East-Asian Australasian Flyway can have far reaching consequences. Further, impacts to the species during one life stage may have carry-over effects to other stages in the annual cycle (DCCEEW, 2024g).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no adopted or made Recovery Plan for this species.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 23 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 23: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Western Alaskan Bar-tailed Godwit

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

C. Background information for the combined fauna assessment: fish

This attachment provides further information about the three fish species addressed in the combined fauna assessment in Section 19-4 of Chapter 19.

The species are:

- Australian Grayling (*Prototroctes maraena*)
- Little Galaxias (*Galaxiella toourtkoourt*)
- Yarra Pygmy Perch (*Nannoperca obscura*)

The following information is provided for each species:

- Species background, including the species' ecology, distribution, habitat, populations, and threats
- A detailed description of the species' occurrence in the Study Area
- Identification and description of each of the relevant potential indirect impacts to each species due to development under the Plan
- An assessment of consistency of the Plan with the species' Recovery Plan
- Identification of relevant Key Threatening Processes and Threat Abatement Plans for each species

AUSTRALIAN GRAYLING (*PROTOTROCTES MARAENA*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Vulnerable
DESCRIPTION	*Prototroctes maraena* (Australian Grayling) is a small to medium fish reaching a maximum length of 330 mm. It is grey-bronze to olive in colour with a silver belly and has extremely thin and deciduous scales (TSSC, 2021).
ECOLOGY	The species has a maximum life expectancy of up to five years, though rarely lives past 3 years. Males reach sexual maturity at one year of age and females at two years of age. Spawning typically occurs after two years of age (TSSC, 2021). The Australian Grayling is a species that migrates between freshwater and salt water. The larval stage is spent in marine water and the adult life is spent in freshwater. The species migrates downstream to the lower reaches of rivers to spawn. This movement is dependent on specific hydrological cues such as water velocity and temperature. Spawning occurs over a two-week period from late-summer to mid-winter, though the timing is dependent on location and environmental factors. Eggs hatch between 10 and 20 days after being laid (TSSC, 2021). Larvae spend approximately 6 months at sea, after which juveniles will return to the freshwater environment (DCCEEW, 2022a). Given a lack of genetic differentiation between Australian Grayling populations, it is likely that juveniles disperse widely. Extensive dispersal may also assist the species in recolonising freshwater habitat where they previously became locally extinct (DCCEEW, 2022a). The species lays large numbers of eggs, demonstrating the ability to quickly repopulate following a period of poor environmental conditions (TSSC, 2021). The Australian Grayling is an omnivorous feeder, its diet consists of crustaceans, aquatic insects, their own larvae, aquatic plants and terrestrial insects and insect larvae (TSSC, 2021).
DISTRIBUTION AND HABITAT	The Australian Grayling is endemic to south-eastern Australia (Backhouse, O'Conner and Jackson, 2008). Historically, it was known to occur in freshwater, estuarine and marine reaches of coastal catchments greater than 200 m above sea level in NSW, Victoria, Tasmania and South Australia. Its current distribution has declined from its historical distribution (TSSC, 2021). In Victoria, the species was incorrectly considered extinct up to 1970. Surveys post-1970 have identified Australian Grayling in almost all coastal rivers east of the Hopkins River. Historically, the strongest abundances of Australian Grayling occurred in the Tambo, Mitchell, Tarwin and Yarra catchments (TSSC, 2021). The species migrates between rivers, their estuaries and coastal seas. It is reliant on free access to a range of freshwater, estuarine and marine habitats for its survival. The majority of the species life is spent in freshwaters, where it occurs in rivers and streams in cool, clear waters or turbid water (Backhouse, O'Conner and Jackson, 2008). The Australian Grayling can occur inland and has been reported up to 100 km upstream from the sea. The species larvae and juveniles occur in estuaries and coastal seas, although their precise marine habitat requirements are not well known (DELWP, 2015a). Habitat critical to survival has not been specified, given the wide distribution and range of habitat used by the species throughout its life (Backhouse, O'Conner and Jackson, 2008).
POPULATIONS	The species is considered to occur as a single population in Victoria. A lack of genetic diversity has been observed in coastal rivers of Victoria, and larvae are most likely dispersed during the marine stage of their life cycle (TSSC, 2021). There are no reliable national population estimates for the species. Due to the species' capacity to lay large quantities of eggs, it has been suggested that the population can undergo large fluctuations and has potential to recover following declines in population size (TSSC, 2021). However, the species is also especially vulnerable to disruptions to spawning or recruitment, given

	most individuals spawn only once during their lifetime (Backhouse, O'Conner and Jackson, 2008). The species undergoes large annual fluctuations in population numbers depending on prevailing conditions (DCCEEW, 2022a). Important populations are those at the limits of the species range, and those known to contain large breeding populations or occur in areas with extensive spawning habitat. These are considered to be 'source' populations for the species (Backhouse, O'Conner and Jackson, 2008).

THREATS	The species Conservation Advice and Recovery Plan has identified the following threats (Backhouse, O'Conner and Jackson, 2008; TSSC, 2021):
	• Habitat loss and fragmentation, including:
	  ○ Fish passage barriers
	  ○ Altered hydrology, sedimentation and poor water quality
	  ○ Changes to coastal morphology
	• Introduced fish species
	• Climate change, including:
	  ○ Increased disconnection between habitats
	  ○ Extreme weather events
	  ○ Changes in ocean physiology
	  ○ Increased intensity, and frequency of wildfires
	• Disease
	• Recreational and commercial fishing

RELEVANT PLANS AND POLICIES	National Recovery Plan for Australian Grayling *Prototroctes maraena* (Backhouse, O'Conner and Jackson, 2008) Conservation Advice *Prototroctes maraena* Australian Grayling (TSSC, 2021)
SPECIES-SPECIFIC GUIDELINES	Survey guidelines for Australia's threatened fish. EPBC Act survey guidelines 6.4 (DSEWPaC, 2011)
SPRAT LINK	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=26179

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	Potential habitat for the species has been mapped in the Moorabool River adjacent to the WGGA.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Australian Grayling used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	All records within the Study Area were considered to be a single population. This is because the species occurs as a single population in Victoria (TSSC, 2021).

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-28 for a map of records and habitat across the Study Area.

There are 12 records (36 individuals) of the Australian Grayling within the Study Area, the most recent of which was recorded in 2021. The species has not been recorded within the Strategic Assessment Area.

There is a total of 1,172.6 ha of mapped potential habitat for the Australian Grayling within the Study Area. Of this, 9.3 ha is located within the Strategic Assessment Area, and 3.5 ha of potential habitat is mapped within the Growth Areas.

Specifically, potential habitat for the Australian Grayling is mapped within the Moorabool River adjacent to the WGGA. Although there are no records of the species in the WGGA, site surveys indicate the presence of suitable habitat for the Australian Grayling within the Moorabool River (EHP, 2021).

Records and habitat of the Australian Grayling occur within the wider Moorabool River catchment. Specifically, 11 records for this species within the Study Area occur where the Moorabool River meets the Barwon River at Fyansford. Habitat is also mapped along the Moorabool River and the Barwon River. The one other record (1 individual) occurs in the Lake Connewarre Complex where some habitat is also mapped.

It is understood that the Corangamite Catchment Management Authority are proposing to remove barriers along the Moorabool River which currently prevent fish from accessing habitat upstream to the WGGA within the coming years. With the removal of these barriers, future planning of the WGGA PSPs should assume the presence of the Australian Grayling (EHP, 2021).

Cowies Creek may provide suitable habitat for the species, although habitat is considered to be poor and lacks "many of the key habitat characteristics associated with Australian Grayling" (EHP, 2021). Further, no records of the species occur at Cowies Creek.

Habitat is also mapped at Hovells Creek, although no records occur at this location.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Conservation Advice and Recovery Plan for the Australian Grayling identifies a range of threats to the species (Backhouse, O'Conner and Jackson, 2008; TSSC, 2021). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following threats to the Australian Grayling are potentially relevant to implementation of the Plan and are discussed further below:

- Altered hydrology, sedimentation and poor water quality
- Recreational fishing

There are a number of additional threats to the species identified in the Conservation Advice and Recovery Plan. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Part 5.

ALTERED HYDROLOGY, SEDIMENTATION AND POOR WATER QUALITY

The Australian Grayling depends on water flow triggers for spawning. It chooses its spawning location based on water velocity and temperature. If water velocities are not high enough during the spawning season, the species will not release eggs. Sufficient flows are required to carry larvae to coastal waters, and to signal for juveniles to swim towards freshwater (TSSC, 2021). Reducing and/or altering the seasonality of flows may impact the reproductive success of the species (Backhouse, O'Conner and Jackson, 2008).

The species is also susceptible to negative impacts associated with poor water quality, including altered water temperatures, altered water chemistry, increased turbidity, and increased nutrient and toxin content. Causes of water quality decline include clearing of vegetation and earthworks, fires, nutrient and sediment runoff from urban and agricultural areas, water diversion, impoundment and droughts. The Australian Grayling may not recolonise areas of sustained poor water quality (Backhouse, O'Conner and Jackson, 2008; TSSC, 2021).

The Australian Grayling is likely to be highly susceptible to sedimentation, as gravel is required for spawning. Once a gravel bed is impacted by siltation, it may take time for subsequent flooding to flush out the finer sediments. Given the species has a short life cycle, several missed breeding seasons may have severe impacts on the species (Backhouse, O'Conner and Jackson, 2008).

RECREATIONAL FISHING

The Australian Grayling was once a popular angling species, yet now is protected from all targeted fishing in Victoria, NSW and Tasmania. However, the species is still caught incidentally by recreational fishers which are targeting

salmonids using fly-fishing methods. As the Australian Grayling is a thin species with deciduous scales, it is very delicate and is extremely prone to handling stress (TSSC, 2021).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

In accordance with Section 146K of the EPBC Act, this section considers whether the implementation of the Plan is not inconsistent with the species' Recovery Plan. It considers two questions:

- Does the Plan prevent achievement of the objectives of the Recovery Plan?
- Does the Plan prevent implementation of the Recovery Plan actions?

These questions are discussed below.

DOES THE PLAN PREVENT ACHIEVEMENT OF THE OBJECTIVES OF THE RECOVERY PLAN?

The overall objective of the Recovery Plan is to minimise the probability of extinction of the Australian Grayling in the wild, and to increase the probability of important populations becoming self-sustaining in the long term. This overall objective is associated with a series of specific objectives (Backhouse, O'Conner and Jackson, 2008):

1. Identify important populations of Australian Grayling
2. Protect and restore habitat for Australian Grayling
3. Investigate important life history attributes to acquire targeted information for management
4. Investigate and manage threats to populations and habitats
5. Increase awareness of Australian Grayling with resource managers and the public

The outcome under the Plan for the Australian Grayling will not prevent the achievement of any of the objectives of the Recovery Plan.

DOES THE PLAN PREVENT IMPLEMENTATION OF THE RECOVERY PLAN ACTIONS?

The Recovery Plan identifies a set of actions in order to deliver on the objectives. Each action is associated with performance criteria (Backhouse, O'Conner and Jackson, 2008). The Plan will not prevent the implementation of any of these actions, nor will it prevent the achievement of any of the performance criteria.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 24 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 24: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Australian Grayling

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

LITTLE GALAXIAS (*GALAXIELLA TOOURTKOOURT*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

Note regarding taxonomic revision of *Galaxiella pusilla*

This species was previously listed as *Galaxiella pusilla* under the EPBC Act. At the time of the species' listing under the EPBC Act, *G. pusilla* was thought to occur from the Mitchell River Basin in Gippsland Victoria to Cortina Lakes in South Australia, including Tasmania (Saddlier, Jackson and Hammer, 2010). However, recent genetic analysis has split this original species into two species: *G. pusilla,* which occurs in eastern Victoria and in Tasmania, and *G. toourtkoourt,* which occurs in western Victoria and South Australia (Coleman, Hoffman and Raaik, 2015).

Differences between *G. pusilla* and *G. toourtkoourt* include morphological and genetic differences. No substantial differences in habitat use or ecological characteristics have been identified between the two species (Coleman, Hoffman and Raaik, 2015).

For this reason, it is considered that descriptions of ecology and habitat use identified within the Recovery Plan for *Galaxiella pusilla* (Saddlier, Jackson and Hammer, 2010) remain adequate for understanding the species' life cycle and habitat requirements.

It is noted that this species is currently not listed and is on the Finalised Priority Assessment List (FPAL). However, given that the species has only been recently re-described, was previously considered threatened, and is proposed to be listed as vulnerable under the new species name, it is considered appropriate to assess this species as a threatened species.

EPBC ACT LISTING	FPAL The Little Galaxias is currently on the Finalised Priority Assessment List (FPAL) and is proposed to be listed as Vulnerable (DAWE, 2024f) A decision is due by 30 April 2026 (DAWE, 2024f)
DESCRIPTION	The Little Galaxias (*G. toourtkoourt*) is a tiny freshwater fish. Females have been recorded by to 42 mm (more commonly 27-32 mm), and males up to 34 mm (more commonly 25-28 mm). The dorsal and upper sides are pale olive-brown, becoming darker towards the dorsal margin. Its sides and belly are silvery-white(Coleman, Hoffman and Raaik, 2015).
ECOLOGY	The Little Galaxias spends its entire life cycle is spent in freshwater. It is a free-swimming species, meaning it is not attached to objects or substrates and is able to swim in open water. The species is likely an annual species, as only one year-class has been observed. Further, adults have been observed dying after spawning (Saddlier, Jackson and Hammer, 2010). The species' diet consists of tiny aquatic invertebrates including chironomid larvae, copepods, cladocerans and ostracods (Saddlier, Jackson and Hammer, 2010). Spawning occurs in late winter-spring. Females lay 65 - 250 eggs over a period of 7 – 14 days. Eggs are attached on the underside of aquatic vegetation or on hard surfaces such as timber or rock. Females are attended to by up to three males which fertilise eggs by passing over them. Larvae hatch after 2 – 3 weeks and are 4.5 mm in length (Saddlier, Jackson and Hammer, 2010).
DISTRIBUTION AND HABITAT	*G. toourtkoourt* is distributed from the upper Barwon River (near Barwon Downs) in Victoria west to Cortina Lakes in SA (Coleman, Hoffman and Raaik, 2015). The species is found in swamps, wetlands, shallow lakes, billabongs, small creeks and artificial earthen drains. Habitats are partially shaded and densely vegetated, with shallow water that is still or flows slowly. The species may also occur in the backwaters of faster moving systems. The substrate tends to be mostly fine sediment (clay and silt), or occasionally coarser materials (sand and coarse organic matter deposits). The species can occur in a wide range of water temperatures, oxygen levels, pH levels, salinity and turbidity (Coleman, Hoffman and Raaik, 2015).

POPULATIONS	Populations have been substantially fragmented and depleted historically by wetland modifications and drainage. Localised extinctions and severe declines have been noted in a number of systems (DCCEEW, 2022b). At the time of the listing of the species under the EPBC Act, it was known from 110 populations – noting that this includes populations of both *G. pusilla* and *G. toourtkoourt*. Of the 110 populations, 28 occur in South Australia (*G. toourtkoourt*), 23 occur in Tasmania (*G. pusilla*), with the remainder occurring in Victoria (including populations of both *G. toourtkoourt* and *G. pusilla*) (Saddlier, Jackson and Hammer, 2010; Coleman, Hoffman and Raaik, 2015) Populations may be tiny and occur in limited ephemeral habitat while others are large and extensive occurring in permanent waterways (Saddlier, Jackson and Hammer, 2010). Populations experience annual cycles and are absent from known sites are certain times. The distribution and abundance of populations fluctuates, reflecting variability in habitat connectivity desiccation and connectivity, spawning and recruitment success, dispersal and colonisation/recolonisation (DCCEEW, 2022b).

THREATS	The species Recovery Plan has identified the following threats (Saddlier, Jackson and Hammer, 2010):
	• Degradation and loss of habitat, due to:
	  ○ Draining of wetlands for development
	  ○ Damage from unrestricted stock access
	  ○ Decreased water quality from increased nutrient runoff, sedimentation and summer water temperatures
	  ○ Ploughing of wetlands when they are dry
	  ○ Damage to crayfish/crayfish burrows (important habitat features) from effects of agricultural pesticides and trampling by stock
	• Alteration to flow regimes
	• Climate change, including decline in rainfall, increased temperature and increased evaporation
	• Introduced aquatic species
	• Illegal collection

RELEVANT PLANS AND POLICIES	There are no relevant plans or policies.
SPECIES-SPECIFIC GUIDELINES	Survey guidelines for Australia's threatened fish. EPBC Act survey guidelines 6.4 (DSEWPaC, 2011)
SPRAT LINK	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=56790

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	Potential habitat for the species has been mapped in the Moorabool River adjacent to the WGGA.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Little Galaxias used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	All records within a single catchment were considered to be a single population.

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-29 for a map of records and habitat across the Study Area.

There is a total of 1,172.6 ha of mapped potential habitat for the Little Galaxias within the Study Area. Of this, 9.3 ha is located within the Strategic Assessment Area, and 3.5 ha of potential habitat is mapped within the Growth Areas.

Specifically, potential habitat for the Little Galaxias is mapped within the Moorabool River adjacent to the WGGA. Although there are no records of the species in the WGGA, site surveys indicate the presence of suitable habitat for the species in the Moorabool River (EHP, 2021).

Cowies Creek may provide suitable habitat for the species although the species has not been recorded in this catchment and habitat is considered to be poor (EHP, 2021).

There are no VBA records of the Little Galaxias within the Study Area. However, the species is known to occur within the upper Barwon River catchment near Barwon Downs, and in the Moorabool River near Batesford (EHP, 2021). It is noted that Batesford is within the Study Area and is near the Strategic Assessment Area. It is possible that there are records of the species in this area which have not been entered into the VBA database.

The Corangamite CMA is proposing to remove in-stream barriers associated with Batesford quarry within the next few years which may allow the Little Galaxias to access upstream habitat within the Moorabool River. With the removal of these barriers, future planning of the WGGA PSPs should assume the presence of the Little Galaxias (EHP, 2021).

Outside of the Growth Areas, habitat is mapped along the Moorabool River, the Barwon River and at Hovells Creek. Some habitat is also mapped within the Lake Connewarre Complex.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Recovery Plan for the Little Galaxias identifies a range of threats to the species (Saddlier, Jackson and Hammer, 2010). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Decreased water quality and alteration to flow regimes
- Illegal collection

There are a number of additional threats to the species identified in the Recovery Plan. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Section 29.5 of Chapter 29.

DECREASED WATER QUALITY AND ALTERATION TO FLOW REGIMES

Reduced riparian vegetation quality often results in water quality declines with regards to increased nutrient runoff, sedimentation and increased summer water temperatures (Saddlier, Jackson and Hammer, 2010).

The species depends on shallow freshwater habitat, including connectivity between wetlands and more permanent waterbodies such as rivers or creeks. Changes to natural flooding and drying cycles, particularly in shallow creeks and swamps, pose a threat to the species, through altering natural seasonal water levels and affecting habitat connectivity and the species' capacity to seek refuge during dry periods. Modes of development which may negatively impact upon water regimes for the species include catchment clearing (which alters hydrological regimes), water abstraction, and planting of trees such as eucalypts and pines which lower groundwater levels and decrease runoff (Saddlier, Jackson and Hammer, 2010).

ILLEGAL COLLECTION

There is anecdotal evidence to indicate the Little Galaxias is currently being collected throughout Victoria by enthusiastic aquarists. This has the potential to decrease population sizes and undermine the genetic integrity of wild populations if specimens are released into the wild into different populations (Saddlier, Jackson and Hammer, 2010).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

There is no current Recovery Plan for *G. toourtkoourt*.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 25 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 25: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Little Galaxias

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

YARRA PYGMY PERCH (*NANNOPERCA OBSCURA*)

SPECIES BACKGROUND

This section sets out the basic information about the species. It provides an overview of the species' ecology, distribution, habitat, populations and threats. These provide context for the impact assessment. At the end of the section are links to key species' documents that provide additional background information.

EPBC ACT LISTING	Endangered
DESCRIPTION	*Nannoperca obscura* (Yarra Pygmy Perch) is a small freshwater fish, up to 75 mm in length. It is olive green above, greenish-brown laterally, and yellow-white underneath (DCCEEW, 2023c).
ECOLOGY	The Yarra Pygmy Perch spends its entire life cycle in freshwater. It is a free-swimming species, meaning it is not attached to objects or substrates and is able to swim in open water. The species is likely to be short lived (1 – 5 years) (DCCEEW, 2023c). The Yarra Pygmy Perch has poor dispersal capacity. The breeding ecology of the Yarra Pygmy Perch is not well known, though is assumed to be similar to the Southern Pygmy Perch, which lays non-adhesive eggs over aquatic vegetation and the substrate. Spawning occurs in spring, in water with a temperature of 16 – 24^{0}C (Saddlier and Hammer, 2010). The species is mostly carnivorous, with a diet comprised of insects and crustaceans (DCCEEW, 2023c). The species is found in small groups, often occurring with the Southern Pygmy Perch. The Yarra Pygmy Perch appears to prefer slightly stronger flows (DCCEEW, 2023c).
DISTRIBUTION AND HABITAT	The Yarra Pygmy Perch is endemic to southern Australia. It occurs from the Maribyrnong River system in Victoria to the Henry Creek Catchment in South Australia. It is most common in western Victoria. The Yarra Pygmy Perch has been highly fragmented, and there has been substantial reduction in genetic diversity. It was previously more widespread and abundant (DCCEEW, 2023c). The species occurs in slow-flowing or still water, which is characterised by large amounts of aquatic vegetation, including lakes, ponds and slow-flowing rivers (DCCEEW, 2023c). It prefers small-medium sized freshwater streams that are relatively shallow (1 – 2 m) and with a moderate to high flow (DCCEEW, 2022b). Connectivity between areas of permanent waterbodies is important for long-term survival (DCCEEW, 2023c).
POPULATIONS	As of 2010, the species had been recorded from 42 sites across Victoria and South Australia, of these, four were thought to be extinct (Saddlier and Hammer, 2010). In 2002, major Victorian populations were thought to occur between the Barwon River and the South-Australia border (DCCEEW, 2022b). The species is at risk of extinction at the edges of its current distribution. Surveys in Victoria have found reasonable numbers around Geelong and Torquay, though absent from Sutherland Creek. Limited numbers have been observed in Lake Corangamite, and further survey is required to confirm the status of this population (DCCEEW, 2023c). There are four Evolutionary Significant Unit (ESU) of the species. These include (DCCEEW, 2023c): • Murray-Darling Basin (ESU) – considered extinct in the wild and maintained in ex situ sites • Central ESU – occurs in the Glenelg River Basin, Millicent Coast and Mount Emu Creek • Merri ESU – occurring in the Merri Catchment • Eastern ESU – including the Thompson, Waurn Ponds and Deep Creek subpopulations •

THREATS	The species Recovery Plan and Conservation Advice has identified the following threats (Saddlier and Hammer, 2010; DCCEEW, 2023c):
	• Degradation and loss of habitat due to:
	  ○ Drainage of wetlands
	  ○ Unrestricted stock access

	○ Reduction in water quality due to increased nutrient runoff and sedimentation ○ Ploughing wetlands when they are dry ○ Impoundment, extraction and urban development • Alteration to flow regimes and water quality • Climate change, including decline in rainfall, increasing temperatures, increasing evaporation, and sea level rise • Introducing aquatic species including the Redfin Perch, Brown Trout and Rainbow Trout • Competition and predation through stocking of native fish including Murray Cod and Golden Perch • Increase in fire frequency and severity • Illegal collection
RELEVANT PLANS AND POLICIES	National Recovery Plan for the Yarra Pygmy Perch (*Nannoperca obscura*) (Saddlier and Hammer, 2010) Conservation Advice for *Nannoperca obscura* (Yarra Pygmy Perch) (DCCEEW, 2023c)
SPECIES-SPECIFIC GUIDELINES	Survey guidelines for Australia's threatened fish. EPBC Act survey guidelines 6.4 (DSEWPaC, 2011)
SPRAT LINK	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=26177

APPROACH TO BASELINE DATA

This section provides a summary of the baseline information used in the assessment. It sets out:

- *An overview of the habitat mapping for the species within and outside the Growth Areas*
- *An overview of the population mapping for the species*

Please refer to Chapter 13 for further details about the approach to threatened species baseline data, including a description of the different types and sources of data, as well as some discussion on the interpretation and suitability of the data for use in the impact assessment.

HABITAT MAPPING	**WITHIN THE SURVEYED AREAS OF THE GROWTH AREAS**
	Potential habitat for the species has been mapped in the Moorabool River adjacent to the WGGA.
	WITHIN THE UNSURVEYED AREAS OF THE GROWTH AREAS
	N/A. There is unlikely to be suitable habitat present for this species.
	OUTSIDE THE GROWTH AREAS
	Habitat important models (HIMs). Habitat mapping for the species across the broader Strategic Assessment Area and Study Area was prepared using DELWPs HIMs. Refer to Chapter 13 of Part 3 for a detailed description of the baseline mapping, landholder surveys, and HIMs.
POPULATION MAPPING	**RECORD SELECTION**
	Species records were compiled from the VBA and surveys undertaken for the project. The VBA records were filtered to remove records from prior to 1990 for the purpose of the impact assessment.
	RECORD DOWNLOAD DATE
	VBA records for the Yarra Pygmy Perch used in this assessment were downloaded in February 2025.
	METHOD FOR IDENTIFYING POPULATIONS
	All records within a single catchment were considered to be a single population.

OCCURRENCE IN THE STUDY AREA

This section describes the occurrence of the species in the Study Area. It includes reference to a map of records and habitat which can be viewed as a separate file. The map provides critical context for the assessment and should be viewed in conjunction with the text presented in this assessment. This section also provides a qualitative description of where records and habitat occur.

See Map 19-30 for a map of records and habitat across the Study Area.

There is a total of 3,536.2 ha of mapped potential habitat for the Yarra Pygmy Perch within the Study Area. Of this, 27.9 ha is located within the Strategic Assessment Area, and 3.5 ha of potential habitat is mapped within the Moorabool River adjacent to the WGGA.

There are 84 VBA records (841 individuals) of the Yarra Pygmy Perch within the Study Area, the most recent of which was recorded in 2022. The species has not been recorded within the Strategic Assessment Area.

VBA records for this species occur in multiple locations along the Barwon River (upstream and downstream of the Strategic Assessment Area), within Waurn Ponds Creek, within the Lake Connewarre Complex, and along Thompson Creek.

It is reported that there are records of the species immediately adjacent to WGGA in the Moorabool River (EHP, 2021). However, there are no records in this locality on the VBA database. It is possible that there are records of the species in this area which have not been entered into the VBA database.

Outside of the Growth Areas, habitat for the species is mapped along the Moorabool River, Barwon River, Waurn Ponds Creek, Armstrong Creek, and Thompson Creek. Some habitat is also mapped within the Lake Connewarre Complex.

POTENTIAL INDIRECT IMPACTS AND MITIGATION

This section identifies the relevant potential indirect impacts to the species that may occur as a result of development under the Plan. Indirect impacts were identified as being relevant to the species if:

- *The indirect impact is identified as a threat in a relevant profile, Conservation Advice, or Recovery Plan, and*
- *The Plan has the potential to introduce or exacerbate the threat in areas which support records and/or mapped habitat for the species*

It describes the mechanism by which each relevant potential indirect impact may affect the species.

Please refer to Chapter 19 for an assessment of how the Plan addresses each indirect impact for this species. Further, please refer to Chapter 17 for a detailed discussion and analysis of indirect impacts and mitigation measures included in the Plan.

RELEVANT POTENTIAL INDIRECT IMPACTS

The Recovery Plan for the Yarra Pygmy Perch identifies a range of threats to the species (Saddlier and Hammer, 2010). Where these threats have the potential to be introduced or exacerbated under the Plan, the Plan includes management strategies to mitigate their impacts.

The following potential indirect impacts (identified as threats) are considered relevant to implementation of the Plan:

- Reduction in water quality and alteration to flow regimes
- Illegal collection

There are a number of additional threats to the species identified in the Recovery Plan. However, potential indirect impacts associated with these threats are considered unlikely given the landscape context of the site and the ecology of the species. Refer to Section 17.2 of Chapter 17 for a detailed assessment of potential indirect impacts associated with the implementation of the Plan.

Climate change is also identified as a threat to the species. The potential impacts of climate change and relevant mitigation measures under the Plan are outlined in Section 19.5 of Part 5.

DECREASED WATER QUALITY AND ALTERATION TO FLOW REGIMES

Reduced riparian vegetation quality can result in water quality declines through increased sedimentation, nutrient runoff and summer water temperatures (Saddlier and Hammer, 2010).

The species depends on shallow freshwater habitat, including connectivity between wetlands and more permanent waterbodies such as rivers or creeks. Changes to natural flooding and drying cycles, particularly in shallow creeks and swamps, pose a threat to the species, through altering natural seasonal water levels and affecting habitat connectivity and the species' capacity to seek refuge during dry periods. Changes to local water tables can also impact the hydrology of smaller rivers and wetlands. Modes of development which may negatively impact upon water regimes for the species include catchment clearing (which alters hydrological regimes), water abstraction, and planting of trees such as eucalypts and pines which lower groundwater levels and decrease runoff (Saddlier and Hammer, 2010).

ILLEGAL COLLECTION

There is no direct evidence of unauthorised collection of the Yarra Pygmy Perch. However, collection of similar small threatened species by aquaculture enthusiasts has been identified as a potential problem in Victoria. There are web-based publications which detail information relating to husbandry of this species, suggesting collecting may be occurring. Collection of individuals is likely to be damaging to this species which exists in small, restricted populations. Further, trading and potential future release of specimens back into the wild in locations other than from which they were collected could undermine the genetic integrity of wild populations (Saddlier and Hammer, 2010).

RECOVERY PLAN, KEY THREATENING PROCESSES AND THREAT ABATEMENT PLANS

Where applicable, this section discusses the consistency of the Plan with any Recovery Plans and relevant Threat Abatement Plans. The general consistency of the Plan with Threat Abatement Plans is discussed in detail in Section 17.3 of Chapter 17.

CONSISTENCY WITH RECOVERY PLAN

In accordance with Section 146K of the EPBC Act, this section considers whether the implementation of the Plan is not inconsistent with the species' Recovery Plan. It considers two questions:

- Does the Plan prevent achievement of the objectives of the Recovery Plan?
- Does the Plan prevent implementation of the Recovery Plan actions?

These questions are discussed below.

DOES THE PLAN PREVENT ACHIEVEMENT OF THE OBJECTIVES OF THE RECOVERY PLAN?

The overall long-term objective of the Recovery Plan is to minimise the probability of extinction and ensure long-term survival of Yarra Pygmy Perch in the wild and to increase the probability of important populations becoming self-sustaining in the long term. This overall objective is associated with a series of specific objectives (Saddlier and Hammer, 2010):

- Determine the distribution and abundance of the Yarra Pygmy Perch
- Determine the genetic and taxonomic status of Yarra Pygmy Perch populations
- Determine Yarra Pygmy Perch habitat characteristics and requirements
- Identify and manage potentially threatening processes impacting on Yarra Pygmy Perch conservation
- Protect key populations across the range of the Yarra Pygmy Perch
- Determine population trends at key sites
- Investigate key aspects of biology and ecology of the Yarra Pygmy Perch
- Establish a captive breeding population of Yarra Pygmy Perch
- Undertake translocations to establish new populations of Yarra Pygmy Perch
- Undertake community education and communication to increase awareness and involvement

The outcome under the Plan for the Yarra Pygmy Perch will not prevent the achievement of any of the objectives of the Recovery Plan.

DOES THE PLAN PREVENT IMPLEMENTATION OF THE RECOVERY PLAN ACTIONS?

The Recovery Plan identifies a set of actions in order to deliver on the objectives. Each action is associated with performance criteria (Saddlier and Hammer, 2010). The Plan will not prevent the implementation of any of these actions, nor will it prevent the achievement of any of the performance criteria.

KEY THREATENING PROCESSES AND CONSISTENCY WITH THREAT ABATEMENT PLANS

Relevant Key Threatening Processes (KTPs) and any of their associated Threat Abatement Plans (TAPs) have been identified in Table 26 where they relate to:

- The potential direct impacts of the Plan, or
- The relevant indirect impacts

Table 26: Relevant Key Threatening Processes and associated Threat Abatement Plans for the Yarra Pygmy Perch

Key threatening process	Threat abatement plan
Land clearance	There is no relevant TAP
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	There is no relevant TAP
Novel biota and their impact on biodiversity	There is no relevant TAP

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