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Marine Habitats and Biodiversity around the Granite Island Causeway



Jason E. Tanner

**SARDI Publication No. F2020/000044-1
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**SARDI Aquatics Sciences
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Science Leader, Marine Ecosystems

Signed:



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EXECUTIVE SUMMARY

The Granite Island causeway at Victor Harbor is an iconic tourist attraction. In 2019, the causeway suffered a failure of several supporting pylons, and was partially closed for 6 months until temporary supports were put in place. The current structure needs extensive upgrading to continue operating, and subsequently, it has been decided to replace it with a new structure located slightly east of the existing causeway. Marine surveys along the proposed route for the new structure showed predominantly dense seagrass, dominated by *Posidonia*, with some *Amphibolis* and *Zostera*. Similar habitats occurred under the existing causeway. Snorkel surveys under the causeway showed that there was limited marine life attached to the pylons, and few fish appeared to utilize the structure and its environs as habitat. Although likely to be present, no syngnathids were seen. From a marine habitat perspective, removal of the existing causeway is unlikely to have any significant impacts, provided that care is taken to minimize disturbance. Similarly, a new causeway that mimics the existing structure is unlikely to have a detrimental impact on the marine habitat. A wider structure has the potential to decrease light availability more than the existing causeway, depending on the materials used for the decking and height above the water, and thus could have negative impacts on seagrasses. Again, care should be taken to minimize habitat disturbance during construction, so that only the seagrass under each pylon is lost.

An EPBC protected matters search identified 42 listed threatened species and 39 listed migratory species as matters of national environmental significance. In addition, 70 listed marine species and 12 whales and other cetaceans were identified under other matters protected by the EPBC Act. The majority of these species will experience little to no impact from the proposed development. The two possible exceptions are southern right whales and little penguins. Southern right whales calve in Encounter Bay in July and August, and consequently may be adversely affected by any loud underwater noises generated by construction activities at this time of year. Little penguins breed on Granite Island from late winter to early summer, and again may be adversely affected by noise, as well as light, and physical blockage of access.

Keywords: Granite Island, Biodiversity, Seagrass

1. INTRODUCTION

1.1. Background

The Granite Island Causeway, which is the only link between Granite Island at Victor Harbor and the mainland, and especially the horse-drawn tram that operates along it, is an iconic tourist destination. In 2019, the tram was forced to stop operating for around 6 months due to the failure of several causeway pylons. Temporary repairs were undertaken in June, allowing resumption of services, but continued structural issues mean that a major overhaul, or complete replacement, are required.

The Department of Planning, Transport and Infrastructure is consequently overseeing the construction of a new causeway along a new alignment, which will allow the current causeway to remain operational during building. Once the new structure has been commissioned, the old causeway will be largely demolished, with a small section retained for its heritage value. The intended alignment is ~ 50 m east of the existing causeway.

1.2. Objectives

As part of the redevelopment process, there is a need to document the marine habitats and assemblages that may be impacted by the development, both along the new alignment as well as on the existing structure. Here we report on:

1. Video surveys of the habitat along the new alignment
2. Snorkel surveys under the existing structure.

In addition, we undertake an assessment of the potential for the construction and demolition to impact on species listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act (1999)*.

2. METHODS

2.1. Video surveys

Three video transects were surveyed approximately 20, 50 and 80 m east of the existing causeway on 19 December 2019. A remote underwater video camera with integrated GPS and live surface feed was deployed from a small vessel as it motored along each transect. Transects commenced and ended as close to the shore as possible without grounding the boat or causing propeller damage to the seagrasses present. At the Granite Island end, this was within 10-20 m of shore, however, at the mainland end it was 30-70 m from the edge of the sand spit. Video footage was subsequently analysed to determine the co-ordinates of each habitat transition, with habitats then plotted on a map. Each seagrass habitat was identified to genus.

2.2. Snorkel surveys

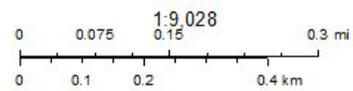
Following the video transects, a single diver snorkeled along the length of the causeway to assess habitats underneath the structure, and in particular to search for any syngnathids and other fauna attached to, or in the vicinity of, the pylons.

2.3. EPBC protected matters search

The EPBC Act protected matters search tool was interrogated on the 9th January 2020 to determine if there are any matters of national environmental significance, or other matters protected under the act, that need to be considered in any redevelopment. The search area used was a box that extended ~ 100m either side of the existing causeway (Figure 1), and with a buffer of 1 km. As a consequence, a number of terrestrial species were identified within the subsequent report.



January 9, 2020



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Map produced by the Department of the Environment.
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Figure 1: Search area (black box) considered using the EPBC Act protected matters search tool. Note that a 1 km buffer was also specified.

3. RESULTS AND DISCUSSION

3.1. Video surveys

All three transects were predominantly seagrass, which accounted for over 91% of the surveyed cover (Table 1). An additional 4.5% was mixed seagrass and macroalgae, while 3.4% was either macroalgae or mixed macroalgae and sand. All seagrass habitats were 100% seagrass cover in the video. The dominant seagrass was *Posidonia* (entirely *P. australis* based on snorkel observations), with 76% cover, followed by *Amphibolis* (primarily *A. antarctica*, but with some *A. griffithii*) and *Zostera* (*Z. tasmanica*). The macroalgae was predominantly *Scaberia agardhii*. Non-seagrass habitats tended to occur towards the ends of each transect (Figure 2), although there was scattered macroalgae throughout.

Seagrass cover along these three transects tended to be higher, and with a greater proportion of *Posidonia* compared to *Amphibolis*, than what has been documented in adjacent areas of Encounter Bay, both east and west of the causeway (Tanner and Theil 2019). These previous transects were, however, located in more exposed areas, and in deeper water, so this difference is not surprising. The genera and species present, however, are typical of those present in shallow waters throughout the state.

Table 1: Cover of different habitats along the proposed alignment for the new Granite Island causeway.

Habitat	Percent Cover
<i>Amphibolis</i>	8.1
<i>Posidonia</i>	76.4
<i>Zostera</i>	4.0
Mixed seagrass	2.8
Seagrass/Macroalgae	4.4
Macroalgae	2.1
Macroalage/Sand	1.3
Sand	0.8



Figure 2: Map showing the location of the video transects, and habitats present along them, alongside the existing Granite Island causeway.

3.2. Snorkel surveys

Dense seagrass cover was observed to extend underneath the causeway, with the exception of the two ends. At the mainland end, the shallowest pylons were surrounded by bare sand (Figure 3a), with a narrow band of macroalgae, dominated by *Hormosira banksii* (Figure 3b) prior to the transition to seagrass. This macroalgal band was in shallower water than could be surveyed in the video transects above, so was not seen in them. At the Granite Island end, there was a small amount of rocky substrate, sparse *Zostera* seagrass and bare sand (Figure 3f). There were no observable qualitative differences between habitats underneath the causeway, and those adjacent to it. Not only was seagrass cover dense underneath the causeway, but the most heavily shaded *Posidonia* under the middle of the causeway was still fruiting (Figure 3e). This suggests that the existing causeway does not result in the seagrasses underneath it being light limited, as its relatively narrow width allows bright light to reach underneath for at least part of the day. As the proposed new causeway is nominally 6 m wide compared to the existing structure which is only 4.8 m wide, it has the potential to cause a greater decrease in light availability, which may lead to a greater impact on seagrasses, particularly in the vicinity of the wider viewing decks, unless constructed in a way that allows some light to pass through.

The pylons themselves had small amounts of mixed algae growing on them, with little invertebrate life, although there were some sponges, bryozoans, polychaete worms and barnacles (Figure 4). There were also few mobile invertebrates observed. Although no detailed taxonomy was undertaken, there was nothing unusual observed in the survey.

Very few fish were observed in association with the causeway. Several schools of unidentified baitfish were observed adjacent, but were unlikely to be associated with the structure. Species that appeared to be more closely associated with the structure were dusky morwong (*Dactylophora nigricans*, 5), old wife (*Enoplosus armatus*, 3) and unidentified bullseyes (*Pempheris*, 23). No syngnathids (seahorses, pipefish, sea dragons) were observed.

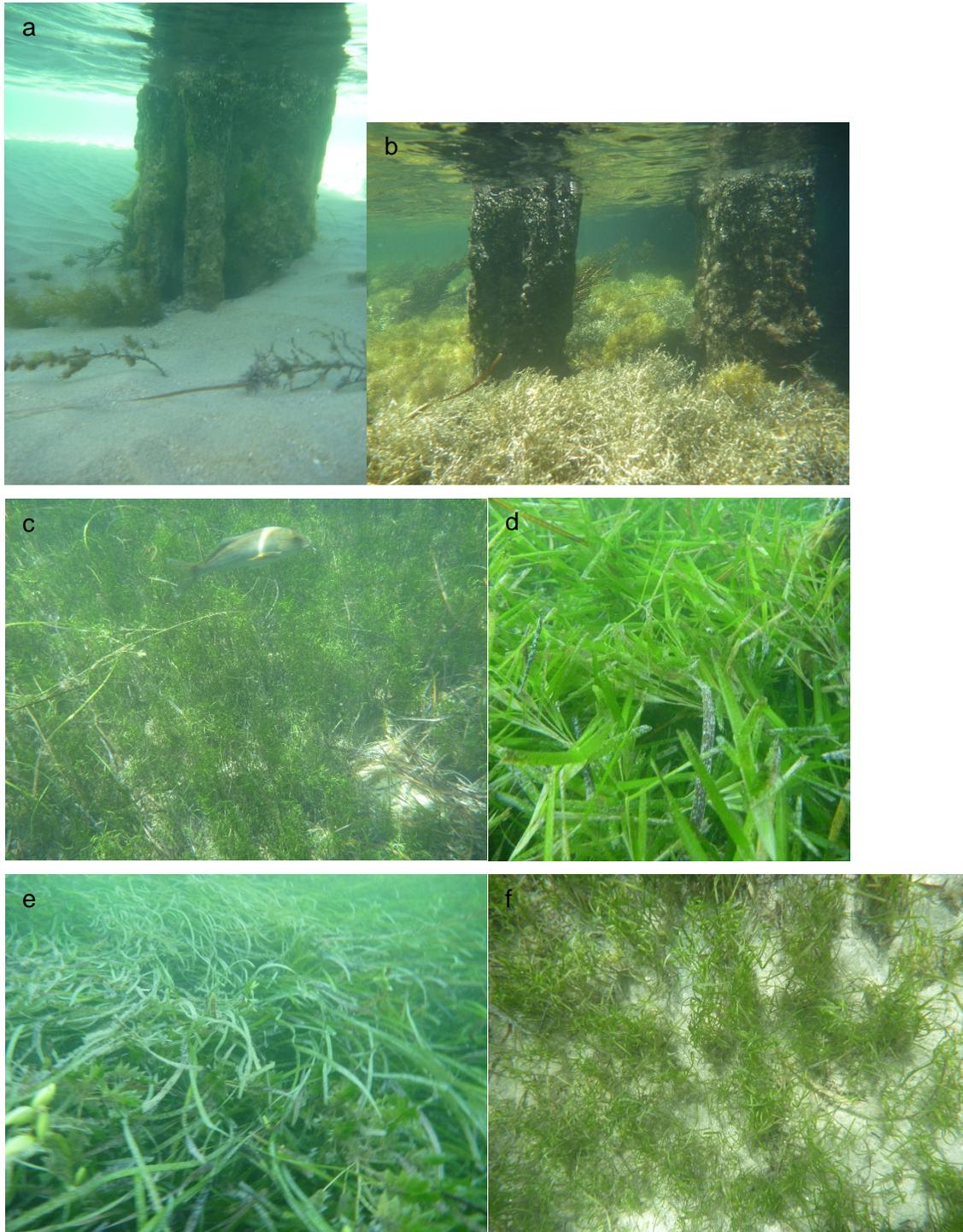


Figure 3: Habitats underneath the causeway: a) bare sand around pylon 21; b) macroalgae, predominantly *Hormosira banksii*, *Scaberia* and *Cystophora*, around pylon 23; c) *Zostera* around pylon 32; d) *Amphibolis griffithii* around pylon 44; e) *Posidonia* around pylon 52, with fruits obvious to the left of the image; f) *Zostera* around pylon 99.



Figure 4: Examples of algal and invertebrate life on causeway pylons: a) *Caulerpa* on pylon 32; b) a shrimp and turfing algae on pylon 37; c) turfing algae and some *Caulerpa* on pylon 44; d) algae and some polychaete worms on pylon 84; e) brown algae, including *Scaberia* and *Cystophora*, on pylon 94; f) *Caulerpa* on pylon 99.

3.3. EPBC protected matters search

The EPBC protected matters search identified 42 listed threatened species and 39 listed migratory species as matters of national environmental significance. In addition, 70 listed marine species and 12 whales and other cetaceans were identified under other matters protected by the EPBC Act. A full copy of the report is reproduced in the appendix.

Of the 42 listed threatened species, there are 22 birds, 6 mammals, 10 plants, 3 reptiles and 1 shark. Six of the birds are listed on the basis that foraging, feeding or related behaviour are likely to occur in the area. The remaining birds are listed on the basis that species or species habitat is known to, is likely to, or may, occur in the area. Given the very small approach areas onto land that will be impacted by the causeway development, and the tiny fraction of foraging habitat affected, it is considered highly unlikely that the development will impact on these species. The mammals include two terrestrial species, which are highly unlikely to be impacted (southern brown bandicoot and grey-headed flying fox), the Australian sea-lion, which may pass through the area occasionally but would not be adversely impacted, and three whale species. While the area is too shallow for whales to approach, any loud and sudden noises while they are in the broader area may have the potential to impact on them (Committee on Potential Impacts of Ambient Noise in the Ocean on Marine Mammals 2003, Southall et al. 2019). This particularly applies to southern right whales, which breed in the area in July and August, although are present from May to September. Subsequently, it is advised the pile driving and similar activities not be undertaken at this time of year. If this cannot be avoided, then appropriate strategies will need to be put in place to minimize impacts on whales. These could include not operating when whales are in Encounter Bay, instituting soft start procedures at all times to give some forewarning, and/or utilizing an alternative pile driving procedure to impact driving that produces less noise. The ten plant species are terrestrial, and although the author cannot provide authoritative advice on these, the causeway approaches to land will be in areas that are already highly modified. The three reptiles are marine turtles that have only rarely been reported in South Australia and are not resident in the area. The shark is the white shark, which is likely to regularly inhabit the general area. The only likely impact on this species would be noise, and any activities involving the generation of loud noises underwater, such as pile driving, should commence with a soft start to allow sharks, and other animals, to leave the area.

The 39 listed migratory species consist of 15 marine birds, 7 cetaceans, 3 marine turtles, 2 sharks, 2 terrestrial birds, and 10 wetland birds. Many of these species are also listed threatened species. Those species that are not also threatened do not present any additional considerations to those discussed above for threatened species. The small-scale and nature of the development means that it is very unlikely to impede any migration or foraging activity of these species.

The listed marine species consist of 38 birds, again with considerable overlap with the above groups, 26 fish (all syngnathids), 3 seals and 3 marine turtles. Although it is highly likely that

some of the syngnathids occur under and around the existing causeway, and on the proposed alignment for the new causeway, none were observed during the surveys described above. For the majority of the species, destructive sampling techniques such as beam trawling would be required to reliably assess their presence. The snorkel surveys were targeted more at larger species, such as the leafy and weedy sea dragons, which would likely have been detected if present. The most likely impacts on these species would relate to habitat loss, and possible noise disturbance. As the only habitat that will be lost is the existing pylons, and a small amount of seagrass under the immediate footprint of the new pylons, this is not considered significant. Soft start procedures are unlikely to help ameliorate against noise impacts for these species, as they are too slow moving to be able to move far. Seahorses kept in noisy tanks for a month exhibit a number of chronic stress responses, including reduced weight and increased mortality (reviewed in Weilgart 2018). This review also found that pile driving has been shown to produce stress responses in some fish, and can cause filter feeders to increase their metabolic activity. In general, elevated noise levels from any source tend to have negative impacts on fish, ranging from mild stress to mortality, depending on species and the characteristics of the noise. It is not anticipated that the construction activities for the causeway will cause noise levels higher than those associated with wharf construction activities that have been undertaken or are proposed to be undertaken in a number of areas around South Australia in and around other seagrass habitats. A potentially greater issue with noise may be the impacts on tuna and other species kept at the Oceanic Victor in-sea aquarium, <700m from the alignment of the new causeway.

Little penguins are also included in the listed marine species. This species has a small breeding colony on Granite Island, with nesting commencing as early as April, and chicks potentially being present up until January, although the main period is late winter to early summer. This species used to have a substantial population on the island (~2000 birds), but this declined rapidly starting around 2000, to a minimum of ~20 birds in 2012. There has been a slight increase since, but only to ~ 44 birds in 2018 (Colombelli-Negrel 2019). Key issues to consider with regards to penguins are noise (especially around dawn/dusk and overnight), light at night, and the potential to block penguin access to the island if the approach point to the island happens to coincide with a penguin access point. It is advised that a locally knowledgeable penguin ecologist be consulted during planning to develop strategies to minimise disturbance to the penguins.

All other listed marine species pose no additional issues to those raised above, and again, many species are also in the threatened and/or migratory species lists.

Finally, there are 12 whales and other cetaceans that may occur in the area. The same issues apply with these as for those whales listed as threatened.

4. CONCLUSION

The habitat underneath the existing causeway, and along the alignment of the proposed new causeway, was predominantly dense seagrass, dominated by *Posidonia*, with some *Amphibolis* and *Zostera*. At the time of this survey, the *Posidonia* was fruiting, and fruits were observed to occur on plants underneath the middle of the causeway. These observations suggest that the existing causeway is not having a detrimental impact on seagrass. If the new causeway causes a greater reduction in light than the existing structure, for example because it is wider, it is possible that seagrasses will be detrimentally affected. The direct loss of seagrass habitat, however, should be largely confined to the footprint of the new pylons. The causeway pylons had a limited amount of invertebrate life on them, being dominated by common macroalgal genera. There were also few fish observed on or around the pylons. Consequently, it is unlikely that the removal of the existing structure will have a detrimental impact on marine life through the removal of habitat.

The major environmental issues of concern are likely to be the potential impacts of the development on little penguins and southern right whales. Both species could be impacted by underwater noise, while penguins could also be impacted by above-water noise, light, and physical blocking of access pathways. Underwater noise needs to be carefully managed during the whale breeding season (July-August), and the main penguin breeding season (late winter to early summer). Above-water noise and light should be minimized between dusk and dawn, especially in the penguin breeding season, but also at other times that the birds are on the island. It is recommended that a penguin ecologist with local expertise be consulted to ensure that appropriate mitigation strategies are developed.

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APPENDIX: EPBC ACT PROTECTED MATTERS REPORT



Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

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

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

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

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[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

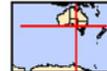
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[Buffer: 1.0Km](#)



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	42
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	70
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	32
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species

Name	Status	Type of Presence
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	habitat known to occur within area Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Thalassarche cauta cauta Shy Albatross [82345]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable	Species or species habitat known to occur within area
Zoothra lunulata halmaturina Bassian Thrush (South Australian) [67121]	Vulnerable	Species or species habitat may occur within area
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Plants		
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat may occur within area
Euphrasia collina subsp. osbornii Osborn's Eyebright [3684]	Endangered	Species or species habitat may occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species

Name	Status	Type of Presence
Hibbertia tenuis [76189]	Critically Endangered	habitat may occur within area Species or species habitat may occur within area
Olearia pannosa subsp. pannosa Silver Daisy-bush, Silver-leaved Daisy, Velvet Daisy-bush [12348]	Vulnerable	Species or species habitat likely to occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat likely to occur within area
Prasophyllum murfettii Fleurieu Leek Orchid [81621]	Critically Endangered	Species or species habitat may occur within area
Prasophyllum pallidum Pale Leek-orchid [20351]	Vulnerable	Species or species habitat may occur within area
Spyridium coactilifolium Butterfly Spyridium [6572]	Vulnerable	Species or species habitat likely to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Sharks		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [64472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Breeding known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land

[\[Resource Information \]](#)

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

Name

Commonwealth Land - Minister of Transport

Listed Marine Species

[\[Resource Information \]](#)

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris canutus		
Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysocolaptes ocellatus		
Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Diomedea antipodensis		
Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora		
Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans		
Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi		
Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor		
Little Penguin [1085]		Breeding known to occur within area

Name	Threatened	Type of Presence
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Larus pacificus Pacific Gull [811]		Foraging, feeding or related behaviour known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Puffinus griseus Sooty Shearwater [1024]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thinomis rubricollis Hooded Plover [59510]		Species or species habitat known to occur within area
Thinomis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area
Fish		
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Vanacampus vercoi Verco's Pipefish [66286]		Species or species habitat may occur within area
Mammals		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat known to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur

Name	Threatened	Type of Presence within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]	
Name	State
Granite Island	SA

Invasive Species[\[Resource Information \]](#)

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

Name	Status	Type of Presence
Birds		
<i>Alauda arvensis</i> Skylark [656]		Species or species habitat likely to occur within area
<i>Anas platyrhynchos</i> Mallard [974]		Species or species habitat likely to occur within area
<i>Carduelis carduelis</i> European Goldfinch [403]		Species or species habitat likely to occur within area
<i>Columba livia</i> Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<i>Passer domesticus</i> House Sparrow [405]		Species or species habitat likely to occur within area
<i>Streptopelia chinensis</i> Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
<i>Sturnus vulgaris</i> Common Starling [389]		Species or species habitat likely to occur within area
<i>Turdus merula</i> Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
<i>Bos taurus</i> Domestic Cattle [16]		Species or species habitat likely to occur within area
<i>Canis lupus familiaris</i> Domestic Dog [82654]		Species or species habitat likely to occur within area
<i>Capra hircus</i> Goat [2]		Species or species habitat likely to occur within area
<i>Felis catus</i> Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
<i>Lepus capensis</i> Brown Hare [127]		Species or species habitat likely to occur within area
<i>Mus musculus</i> House Mouse [120]		Species or species habitat likely to occur within area
<i>Oryctolagus cuniculus</i> Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
<i>Rattus rattus</i> Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
<i>Vulpes vulpes</i> Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
<i>Anredera cordifolia</i> Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
<i>Asparagus asparagoides</i> Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
<i>Asparagus declinatus</i> Bridal Veil, Bridal Veil Creeper, Pale Berry Asparagus Fern, Asparagus Fern, South African Creeper [66908]		Species or species habitat likely to occur within area
<i>Asparagus scandens</i> Asparagus Fern, Climbing Asparagus Fern [23255]		Species or species habitat likely to occur within area
<i>Chrysanthemoides monilifera</i> subsp. <i>monilifera</i> Boneseed [16905]		Species or species habitat likely to occur within area
<i>Cytisus scoparius</i> Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
<i>Genista linifolia</i> Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
<i>Genista monspessulana</i> Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
<i>Lycium ferocissimum</i> African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
<i>Pinus radiata</i> Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
<i>Rubus fruticosus</i> aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
<i>Salix</i> spp. except <i>S. babylonica</i> , <i>S. x calodendron</i> & <i>S. x reichardtii</i> Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
<i>Solanum elaeagnifolium</i> Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area
<i>Tamarix aphylla</i> Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
<i>Ulex europaeus</i> Gorse, Furze [7693]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

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

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

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat, or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-35.558395 138.624452,-35.557592 138.626705,-35.561799 138.629709,-35.562479 138.627349,-35.558395 138.624452

Acknowledgements

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- [Office of Environment and Heritage, New South Wales](#)
- [Department of Environment and Primary Industries, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment, Water and Natural Resources, South Australia](#)
- [Department of Land and Resource Management, Northern Territory](#)
- [Department of Environmental and Heritage Protection, Queensland](#)
- [Department of Parks and Wildlife, Western Australia](#)
- [Environment and Planning Directorate, ACT](#)
- [Birdlife Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Museum Victoria](#)
- [Australian Museum](#)
- [South Australian Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- [Australian Tropical Herbarium, Cairns](#)
- [eBird Australia](#)
- [Australian Government – Australian Antarctic Data Centre](#)
- [Museum and Art Gallery of the Northern Territory](#)
- [Australian Government National Environmental Science Program](#)
- [Australian Institute of Marine Science](#)
- [Reef Life Survey Australia](#)
- [American Museum of Natural History](#)
- [Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

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

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

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