#### Windfarm Mundabiddi Survey 7/9/21

(Botanist)

(Technical officers)

A targeted survey for Threatened and Priority Flora was completed with a search of the proposed realignment of the Munda Biddi from the windfarm north to Elleker-Grassmere Rd on the 07/09/21. The search area was a 50m wide alignment along the proposed route.

We found no Threatened or Priority Flora and no TECs/PECS during the survey. The survey area included vegetation in excellent condition with limited existing disturbance. Clearing should be minimised as much as possible and mitigation measures implemented to avoid indirect impacts (such as erosion and the spread of weeds).

It is recommended to avoid individuals of *Banksia praemorsa* where possible and any large Eucalyptus and Melaleuca species. It is also recommended that impacts on the wetland habitat are avoided (including any potential indirect impacts from drainage alteration etc).

We also recommend weed management measures during construction to avoid spreading weeds, particularly the existing infestations of Arum Lily, Sydney Golden Wattle and Bridal Creeper (mainly at the very southern end).

Please find attached shapefiles with existing weed locations.



WIndfarm Munda Biddi 07.09

#### Family

Aizoaceae Anarthriaceae Anarthriaceae Apiaceae Apocynaceae Araceae Araliaceae Asparagaceae Asteraceae Asteraceae Asteraceae Asteraceae Brassicaceae Casuarinaceae Casuarinaceae Casuarinaceae Colchicaceae Cyperaceae Cyperaceae Cyperaceae Cyperaceae Cyperaceae Cyperaceae Cyperaceae Cyperaceae Dasypogonaceae Dennstaedtiaceae Dilleniaceae Dilleniaceae Dilleniaceae Dilleniaceae Dilleniaceae Droseraceae Droseraceae Droseraceae Droseraceae Elaeocarpaceae Ericaceae Ericaceae Ericaceae Ericaceae Ericaceae Ericaceae Euphorbiaceae Euphorbiaceae Fabaceae Fabaceae

**Species** Status Genus Carpobrotus sp. Anarthria prolifera Anarthria scabra Platysace compressa Vinca major Zantedeschia aethiopica Hydrocotyle diantha Asparagus asparagoides\* Craspedia variabilis Hypochaeris sp. Olearia axillaris Pithocarpa cordata \* Heliophila pusilla fraseriana Allocasuarina humilis Allocasuarina Allocasuarina lehmanniana **Burchardia** congesta grandiflorum Ammothryon curvifolius Chaetospora Cyathochaeta avenacea Evandra aristata Gahnia decomposita Lepidosperma effusum Lepidosperma sp. Lepidosperma squamatum Dasypogon bromeliifolius Pteridium esculentum Hibbertia cuneiformis Hibbertia cunninghamii Hibbertia grossulariifolia Hibbertia racemosa Hibbertia furfuracea Drosera ervthrogyne Drosera erythrorhiza hamiltonii Drosera huegelii Drosera stelligera Tremandra Leucopogon rubricaulis obovatus subsp. Obovatus Leucopogon Leucopogon parviflorus Lysinema ciliatum Styphelia pendula Styphelia sp. Amperea ericoides Amperea protensa Acacia alata Acacia cochlearis Acacia hastulata littorea Acacia Acacia longifolia Acacia melanoxylon \* Aotus intermedia linophylla Bossiaea Callistachys lanceolata Chorizema glycinifolium Chorizema ilicifolium

#### WIndfarm Munda Biddi 07.09

Fabaceae Fabaceae Fabaceae Fabaceae Fabaceae Fabaceae Geraniaceae Geraniaceae Goodeniaceae Gyrostemonaceae Haemodoracae Haemodoracae Hemerocallidaceae Iridaceae Lauraceae Loganiaceae Loganiaceae Loganiaceae Lyginiaceae Menyanthaceae Myrtaceae **Myrtaceae Myrtaceae** Myrtaceae Myrtaceae **Myrtaceae Myrtaceae** Myrtaceae Myrtaceae **Myrtaceae Myrtaceae** Myrtaceae Olacaceae Orchidaceae Oxalidaceae Phyllanthaceae Pittosporaceae Pittosporaceae Poaceae Poaceae Portulaceae Proteaceae Proteaceae Proteaceae Proteaceae

Gompholobium capitatum Gompholobium confertum Hardenbergia comptoniana Jacksonia horrida Kennedia coccinea Pultenaea reticulata Geranium sp. Pelargonium capitatum Goodenia trinervis Gyrostemon sheathii Anigozanthos flavidus Conostylis aculeata Chamaescilla corymbosa Patersonia occidentalis Cassytha sp. Logania vaginalis Orianthera serpyllifolia subsp. Serpyllifolia Phyllangium paradoxum Lyginia imberbis Ornduffia parnassifolia Agonis flexuosa Corymbia calophylla Eucalyptus cornuta Eucalyptus marginata Eucalyptus megacarpa Eucalyptus staeri Hypocalymma cordifolium Kunzea ericifolia Melaleuca preissiana Melaleuca thymoides Taxandria juniperina parviceps Taxandria Olax phyllanthi Caladenia cairnsiana latifolia Caladenia Cryptostylis ovata \* Disa bracteata Diuris longifolia Drakaea alyptodon Drakaea thynniphila Lyperanthus serratus Pterostylis recurva Pterostylis sp. Pterostylis vittata **Pyrorchis** nigricans Thelymitra ?crinita \* Oxalis sp. **Phyllanthus** calycinus Billardiera fusiformis Pittosporum undulatum \* Anthoxanthum odoratum Briza maxima Calandrinia sp. Adenanthos cuneatus Banksia attenuata Banksia dallanneyi Banksia grandis

WIndfarm Munda Biddi 07.09 Proteaceae Banksia praemorsa Proteaceae Banksia quercifolia sessilis Proteaceae Banksia Hakea oleifolia Proteaceae Proteaceae Hakea prostrata Proteaceae Hakea ruscifolia Hakea varia Proteaceae Proteaceae Isopogon attenuatus Proteaceae Isopogon formosus subsp. Formosus Clematis Ranunculaceae pubescens Restionaceae Desmocladus flexuosus gracillimum Restionaceae Empodisma Restionaceae Hypolaena exsulca Leptocarpus Restionaceae scariosus Rhamnaceae Spyridium globulosum Rubus Rosaceae sp. Rubiaceae Opercularia hispidula Opercularia vaginata Rubiaceae Rutaceae Boronia crenulata scrobiculata Santalaceae Leptomeria Santalaceae Leptomeria squarrulosa Stylidiaceae Stylidium ?amoenum Stylidiaceae Stylidium diversifolium Pimelea Thymeleaceae ferruginea

## Munda Biddi Trail Realignment, City of Albany Sandpatch Reserve

Desktop Review, Reconnaissance and Alignment Alteration

, DBCA South Coast Region

## Summary

A realignment of the Munda Biddi trail through sections of City of Albany Reserve was planned for 2022 (Figure 1). The purpose of the realignment was to increase visitor amenity and safety by reducing the length of the existing trail that uses the Lower Denmark Road, a heavily trafficked road without adequate safety margins for cyclists.

As part of an assessment of the environmental values along the proposed realignment, a desktop review of the fauna values occurring or potentially occurring within the potential impact footprint (a 25 m wide corridor either side of a linear polygon) was conducted.

This yielded 15 fauna taxa considered likely to occur within the realignment footprint, or with the potential to occur. Due to the nature of the proposed impacts, the taxon considered to be most likely impacted was *Zephyrarchaea mainae*, an assassin spider listed as Vulnerable under the Biodiversity Conservation Act 2016 (Wildlife Conservation (Specially Protected Fauna) Notice 2018, schedule 3).

As a result, the authors walked the proposed alignment and determined that it did intersect potential habitat for *Zephyrarchaea mainae*. The results of this reconnaissance survey and the desktop review are presented here.

The principal outcome of these studies was that the proposed Munda Biddi trail alignment was altered at a local scale to minimise potential impacts to *Zephyrarchaea mainae* microhabitat patches.

### **Desktop Review**

The proposed Munda Biddi realignment was buffered by 20 km to create a polygon for searching conservation significant fauna databases.

The EPBC Protected Matters Search Tool and DBCA threatened fauna databases were queried, yielding a list of 110 threatened species that could occur in the study area. Of these, 95 were deemed to be unlikely to occur or not occurring (20 were aquatic, 12 occurred historically, with no recent records, 26 were marine species, 36 had no suitable habitat within the development corridor (e.g. shorebird species for which habitat was absent), and one, Grey Falcon, was considered to be far outside of its normal range and therefore very unlikely to occur (Appendix 1).

This left a group of 15 threatened fauna species considered likely or with potential to occur (Table 1). Of these species, most were deemed not to be at risk from the proposed works, but a reconnaissance survey of the study area corridor was planned to determine whether habitat suitable for Main's assassin spider (*Zephyrarchaea mainae*, listed as Vulnerable under the Biodiversity Conservation Act 2016 (Wildlife Conservation (Specially Protected Fauna) Notice 2018, schedule 3)), was present. This species was considered the most likely threatened taxon to be present, and potentially impacted.

#### **Reconnaissance Survey and Alignment Alteration**

On the 14<sup>th</sup> October 2021, **Conservation** (DBCA Regional Ecologist) and **Conservation** (DBCA Conservation Officer) walked the proposed alignment and noted that habitat for *Zephyrarchaea mainae* was present in a number of small patches where the alignment traversed thicker vegetation with a suspended litter midstorey, such as at minor drainages.

As a result, the proposed trail alignment was rerouted to avoid most of the areas of potential *Z. mainae* habitat (Figure 1).

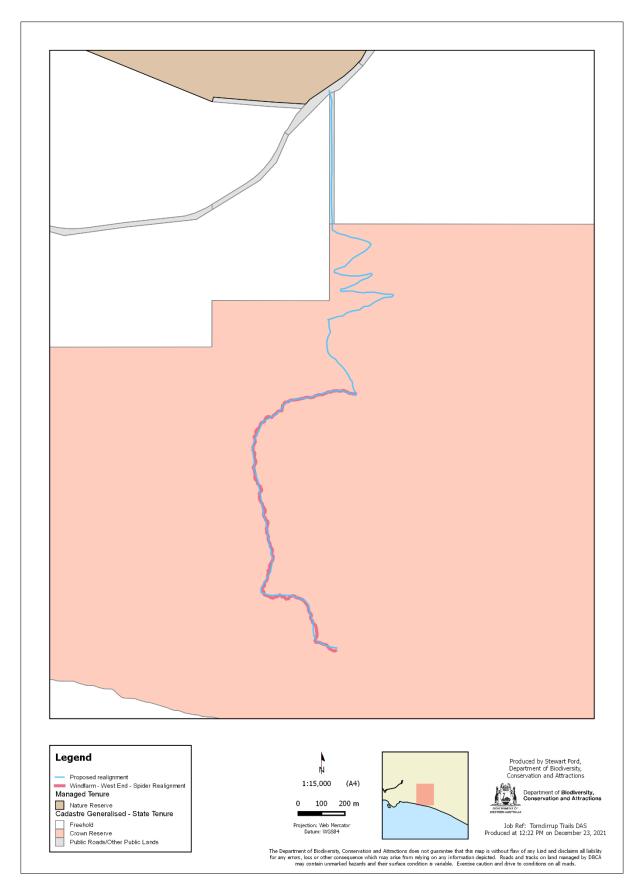
The alignment alteration was completed by **Example 1** and **Example 2** (DBCA Project Manager) on 26 November 2021. Areas of potential *Z. mainae* habitat as well as any areas of thicker vegetation were avoided to produce an updated route, shown in red on Figure 1. Localised areas of greatest potential for harbouring other potentially affected species, the Western Australian Pill Millipede (*Cynotelopus notabilis*, listed as Endangered under the Biodiversity Conservation Act 2016 (Wildlife Conservation (Specially Protected Fauna) Notice 2018, schedule 2)) and the Shortnosed Snake (*Elapognathus minor*, DBCA Priority 2), were also avoided.

Minimising the clearing of denser vegetation patches by altering the alignment also benefitted those species that may have resided in them, but were expected to move away in response to disturbance during clearing, such as Quenda (*Isoodon fusciventer*, DBCA Priority 4).

### References

EPBC Protected Matters Search Tool (accessed 14 December 2021), https://www.awe.gov.au/environment/epbc/protected-matters-search-tool

DBCA Threatened Fauna Database (extract) (accessed 14 December 2021)



# **Figure 1** Proposed Munda Biddi Trail realignment. Original is blue, and the updated alignment to avoid *Zephyrarchaea mainae* habitat is red.

#### Table 1 Species considered to be likely to occur or have the potential to occur within the study area

Status	Common Name	Scientific Name	Conservation Code Status		DBCA record s	EPBC PMST	Comments	
Birds								
Likely	Calyptorhynchus baudinii	Baudin's Black-Cockatoo	EN	Endangered species	277	•	Species or species habitat will not b	
Likely	Calyptorhynchus latirostris	Carnaby's Black-Cockatoo	EN	Endangered species	484	•	Species or species habitat will not b	
Likely	Pandion cristatus	Eastern Osprey	MI	Migratory species	128		Species or species habitat will not b	
Likely	Calyptorhynchus banksii naso	Forest Red-tailed Black- Cockatoo	VU	Vulnerable species	24	•	Species or species habitat will not b	
Potential	Apus pacificus	Fork-tailed Swift	MI	Migratory species	5		Species or species habitat will not b	
Potential	Tyto novaehollandiae novaehollandiae	Masked Owl	P3	Priority 3: Poorly-known species	3		Species or species habitat will not b	
Likely	Falco peregrinus	Peregrine Falcon	OS	Other specially protected fauna	34		Species or species habitat will not b	
Potential	Psophodes nigrogularis nigrogularis	Western Whipbird (western heath)	EN	Endangered species	5	•	Species or species habitat will not b	
Invertebrate s								
Likely	Zephyrarchaea mainae	Main's Assassin Spider	VU	Vulnerable species	48		The original alignment traversed sor would likely have had an impact on alignment largely avoids thicker area considerably reducing the likelihood	
Potential	Cynotelopus notabilis	Western Australian Pill Millipede	EN	Endangered species	83		The alignment did include areas of p records of the species in the area su effort within the study area, all recor (10 km to the south-west of the study	
Mammals								
Likely	Isoodon fusciventer	Quenda, southwestern brown bandicoot	P4	Priority 4: Rare, Near Threatened and other species in need of monitoring	211		Quenda are highly mobile in respon- expected to be impacted by the pro	
Likely	Phascogale tapoatafa wambenger	South-western Brush-tailed Phascogale, wambenger	CD	Species of special conservation interest (conservation dependent fauna)			Species or species habitat will not b	
Likely	Notamacropus irma	Western Brush Wallaby	P4	Priority 4: Rare, Near Threatened and other species in need of monitoring	5		Species or species habitat will not b	
Likely	Pseudocheirus occidentalis	Western Ringtail Possum, ngwayir	CR	Critically endangered species	675	•	Species or species habitat will not b	
Reptiles	•							
Potential	Elapognathus minor	Short-nosed Snake	P2	Priority 2: Poorly-known species	9		The microhabitat favoured by the sp and heath) is widespread but patchy routing the alignment, much of the the anticipated that any individuals prest before being impacted.	

be impacted by the proposed works.

some areas of potential habitat that, if cleared, n individuals of the species. The updated reas with microhabitats suitable for the species, od that the species' habitat will be impacted.

f potential habitat, but there have been no surrounding the proposed works. Despite survey ords of the millipede are from West Cape Howe udy area), to Denmark.

onse to disturbance, and individuals are not roposed works.

be impacted by the proposed works.

be impacted by the proposed works.

be impacted by the proposed works.

species (low, dense vegetation such as sedges by within the development corridor. After rethicker vegetation has been avoided and it is esent when clearing occurs will move away

Appendix 1	Taxa not occurring or considered to b	be unlikely to occur

Group	Scientific Name	Common Name	Conservatio n Code	Status	DBCA records	EPBC PMST
Aquatic species						
Fish	Carcharias taurus	Grey Nurse Shark	VU	Vulnerable species	•	•
Fish	Carcharodon carcharias	Great White Shark	VU	Vulnerable species	•	•
Fish	Galaxias truttaceus (Western Australian population)	Western Trout Minnow, western spotted galaxias	EN	Endangered species	•	
Fish	Galaxiella munda	Mud Minnow, western dwarf galaxias	VU	Vulnerable species	•	
Fish	Galaxiella nigrostriata	Black-stripe Minnow, black-striped dwarf galaxias	EN	Endangered species	•	
Fish	Galeorhinus galeus	School Shark	CD	Conservation dependent		
Fish	Geotria australis	Pouched Lamprey	P3	Priority 3: Poorly-known species	•	
Fish	Lepidogalaxias salamandroides	Salamanderfish	EN	Endangered species	•	
Fish	Nannatherina balstoni	Balston's Pygmy Perch	VU	Vulnerable species	•	•
Fish	Phycodurus eques	Leafy Sea Dragon	P2	Priority 2: Poorly-known species	•	
Fish	Rhincodon typus	Whale Shark	OS	Other specially protected fauna	•	•
Fish	Thunnus maccoyii	Southern Bluefin Tuna	CD	Conservation dependent		•
Invertebrate	Westralunio carteri	Carter's Freshwater mussel	VU	Vulnerable species	•	•
Mammal	Arctocephalus tropicalis	Subantarctic Fur-seal	VU	Vulnerable species	•	
Mammal	Balaenoptera borealis	Sei Whale	VU	Vulnerable species		•
Mammal	Balaenoptera musculus	Blue Whale	EN	Endangered species	•	•
Mammal	Balaenoptera physalus	Fin Whale	VU	Vulnerable species		•
Mammal	Eubalaena australis	Southern Right Whale	EN	Endangered species	•	•
Mammal	Megaptera novaeangliae	Humpback Whale	VU	Vulnerable species		•
Mammal	Physeter macrocephalus	Sperm Whale	VU	Vulnerable species	•	
Historical						
Bird	Atrichornis clamosus	Noisy Scrub-bird, tjimiluk	EN	Endangered species	•	
Bird	Dasyornis longirostris	Western Bristlebird	EN	Endangered species	•	•
Bird	Leipoa ocellata	Malleefowl	VU	Vulnerable species	•	
Bird	Pezoporus flaviventris	Western Ground Parrot	CR	Critically endangered species	•	
Invertebrate	Helicarion castanea	a helicarionid land snail	Ex	Extinct species	•	
Invertebrate	Hylaeus globuliferus	Woolybush Bee	P3	Priority 3: Poorly-known species	•	
Mammal	Bettongia penicillata ogilbyi	Woylie, Brush-tailed bettong	CR	Critically endangered species	•	
Mammal	Dasyurus geoffroii	Chuditch, western quoll	VU	Vulnerable species	•	•
Mammal	Macrotis lagotis	Greater Bilby, dalgyte, ninu	VU	Vulnerable species	•	
Mammal	Myrmecobius fasciatus	Numbat, walpurti	EN	Endangered species	•	
Mammal	Parantechinus apicalis	Dibbler	EN	Endangered species	•	•
Mammal	Setonix brachyurus	Quokka	VU	Vulnerable species	•	
Marine species						
Bird	Ardenna carneipes	Flesh-footed Shearwater	VU	Vulnerable species	•	
Bird	Ardenna tenuirostris	Short-tailed Shearwater	MI	Migratory species	•	
Bird	Diomedea antipodensis	Antipodean Albatross	VU	Vulnerable species		•
Bird	Diomedea dabbenena	Tristan Albatross	EN	Endangered species		•
Bird	Diomedea epomophora	Southern Royal Albatross	VU	Vulnerable species		•
Bird	Diomedea exulans	Wandering Albatross	VU	Vulnerable species	•	1

Group	Scientific Name	Common Name	Conservatio n Code	Status	DBCA records	EPBC PMST
Bird	Diomedea sanfordi	Northern Royal Albatross	EN	Endangered species		•
Bird	Halobaena caerulea	Blue Petrel	VU	Vulnerable species		
Bird	Macronectes giganteus	Southern Giant Petrel	EN	Endangered species	•	•
Bird	Macronectes halli	Northern Giant Petrel	VU	Vulnerable species		•
Bird	Oceanites oceanicus	Wilson's Storm-petrel	MI	Migratory species	•	
Bird	Pachyptila turtur subantarctica	Fairy Prion (southern)	VU	Vulnerable species		•
Bird	Phoebetria fusca	Sooty Albatross	VU	Vulnerable species		•
Bird	Pterodroma mollis	Soft-plumaged Petrel	VU	Vulnerable species		•
Bird	Puffinus huttoni	Hutton's Shearwater	EN	Endangered species	•	
Bird	Stercorarius antarcticus lonnbergi	Brown Skua	P4	Priority 4: Rare, Near Threatened and other species in need of monitoring	•	
Bird	Stercorarius parasiticus	Arctic Jaeger	MI	Migratory species	•	
Bird	Thalassarche carteri	Indian Yellow-nosed Albatross	EN	Endangered species	•	•
Bird	Thalassarche cauta cauta	Shy Albatross	VU	Vulnerable species	•	•
Bird	Thalassarche chlororhynchos	Atlantic Yellow-nosed Albatross	VU	Vulnerable species	•	
Bird	Thalassarche impavida	Campbell Albatross, Campbell Black-browed Albatross	VU	Vulnerable species		•
Bird	Thalassarche melanophris	Black-browed Albatross	EN	Endangered species	•	
Bird	Thalassarche steadi	White-capped Albatross	VU	Vulnerable species		•
Reptile	Caretta caretta	Loggerhead Turtle	EN	Endangered species	•	
Reptile	Chelonia mydas	Green Turtle	VU	Vulnerable species		•
Reptile	Dermochelys coriacea	Leatherback Turtle	EN	Endangered species	•	
No suitable ha	abitat	- <b>·</b>			•	
Bird	Actitis hypoleucos	Common Sandpiper	MI	Migratory species	•	
Bird	Arenaria interpres	Ruddy turnstone	MI	Migratory species	•	
Bird	Botaurus poiciloptilus	Australasian Bittern	EN	Endangered species	•	•
Bird	Calidris acuminata	Sharp-tailed Sandpiper	MI	Migratory species	•	
Bird	Calidris alba	Sanderling	MI	Migratory species	•	
Bird	Calidris canutus	Red Knot	EN	Endangered species	•	•
Bird	Calidris ferruginea	Curlew Sandpiper	CR	Critically endangered species	•	•
Bird	Calidris ruficollis	Red-necked stint	MI	Migratory species	•	
Bird	Calidris tenuirostris	Great Knot	CR	Critically endangered species	•	•
Bird	Cereopsis novaehollandiae grisea	Cape Barren goose	VU	Vulnerable species	•	•
Bird	Charadrius leschenaultii	Greater Sand Plover	VU	Vulnerable species	•	•
Bird	Charadrius mongolus	Lesser Sand Plover	EN	Endangered species	•	•
Bird	Hydroprogne caspia	Caspian Tern	MI	Migratory species	•	
Bird	Limosa lapponica	Bar-tailed Godwit	CR	Critically endangered species	•	•
Bird	Limosa limosa	Black-tailed Godwit	MI	Migratory species	•	
Bird	Numenius madagascariensis	Eastern Curlew	CR	Critically endangered species	•	•
Bird	Numenius phaeopus	Whimbrel	MI	Migratory species	•	
Bird	Oxyura australis	Blue-billed Duck	P4	Priority 4: Rare, Near Threatened and other species in need of monitoring	•	
Bird	Pandion cristatus	Eastern Osprey	MI	Migratory species	•	
Bird	Phaethon rubricauda	Red-tailed Tropicbird	P4	Priority 4: Rare, Near Threatened and other species in need of monitoring	•	

Group	Scientific Name Common Name		Conservatio n Code	Status	DBCA records	EPBC PMST
Bird	Philomachus pugnax	Ruff	MI	Migratory species	•	
Bird	Plegadis falcinellus	Glossy Ibis	MI	Migratory species	•	
Bird	Pluvialis fulva	Pacific Golden Plover	MI	Migratory species	•	
Bird	Pluvialis squatarola	Grey Plover	MI	Migratory species	•	
Bird	Sternula nereis nereis	Australian Fairy Tern	VU	Vulnerable species		•
Bird	Thalasseus bergii	Crested Tern	MI	Migratory species	•	
Bird	Thinornis rubricollis	Hooded Plover	P4	Priority 4: Rare, Near Threatened and other species in need of monitoring	•	
Bird	Tringa brevipes	Grey-tailed Tattler	P4	Priority 4: Rare, Near Threatened and other species in need of monitoring	•	
Bird	Tringa glareola	Wood Sandpiper	MI	Migratory species	•	
Bird	Tringa nebularia	Common Greenshank	MI	Migratory species	•	
Bird	Tringa stagnatilis	Marsh Sandpiper	MI	Migratory species	•	
Bird	Xenus cinereus	Terek Sandpiper	MI	Migratory species	•	
Invertebrate	Trioza barrettae	Banksia brownii Plant-louse	EN	Endangered species	•	•
Mammal	Arctocephalus forsteri	New Zealand Fur-seal, long-nosed Fur-seal	OS	Other specially protected fauna	•	
Mammal	Hydromys chrysogaster	Water-rat, rakali	P4	Priority 4: Rare, Near Threatened and other species in need of monitoring	•	
Mammal	Neophoca cinerea	Australian Sea-lion	VU	Vulnerable species	•	•
Outside range	· · ·	· · ·	•	·	•	
Bird	Falco hypoleucos	Grey Falcon	VU	Vulnerable		•

Munda Biddi Windfarm realignment

(Original realignment with buffer, and revised alignment)

# Legend

- MB-Windfarm-Spider Realignment tracks
- Windfarm realign-new only
- 25m Buffer

NOTES : flora survey conducted within the '25m buffer' area (25m either side of original alignment). The 'MB-windfarm-spider realignment' line indicates revised alignment to avoid Assasin spider habitat. Revised alignment is within the 25m buffer area.

100 200 300 400 500 m

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