



Ramsar Information Sheet

Australia

Glenelg Estuary and Discovery Bay Ramsar Site



Designation date	28 February 2018
Site number	2344
Coordinates	38°05'S 141°07'27"E
Area	22 289,00 ha

Color codes

Fields back-shaded in light blue relate to data and information required only for RIS updates.

Note that some fields concerning aspects of Part 3, the Ecological Character Description of the RIS (tinted in purple), are not expected to be completed as part of a standard RIS, but are included for completeness so as to provide the requested consistency between the RIS and the format of a 'full' Ecological Character Description, as adopted in Resolution X.15 (2008). If a Contracting Party does have information available that is relevant to these fields (for example from a national format Ecological Character Description) it may, if it wishes to, include information in these additional fields.

1 - Summary

Summary

The Glenelg Estuary and Discovery Bay Ramsar Site is situated in western Victoria. It covers 22,289 hectares and comprises portions of the Lower Glenelg National Park, the Discovery Bay Coastal Park and the Nelson Streamside Reserve. The Glenelg River estuary is the longest in the bioregion, extending 75 km. The Ramsar site comprises three broad systems that support different wetland types: freshwater wetlands, the Glenelg Estuary and the beach and dune system. The site contains several regionally (and internationally) rare wetland types: intact fen peatlands and a humid dune slack system.

The site:

- supports the nationally vulnerable coastal saltmarsh ecological community and eight nationally / internationally listed threatened flora and fauna species.
- provides habitat for 95 waterbird species including 24 species listed under international agreements: CAMBA (24), JAMBA (24), ROKAMBA (21), BONN (21). Beach nesting birds such as hooded plover (*Thinornis rubricollis*) and red-capped plover (*Charadrius ruficapillus*) are regularly recorded nesting on the dunes of the Discovery Bay Coastal Park.
- supports 14 species of native fish which are diadromous, migrating between habitats for part of their lifecycle by providing food, spawning grounds and nurseries. It also acts as a migration path on which diadromous fishes of the region depend.
- provides habitat for obligate aquatic species in the permanent wetlands of the Long Swamp complex and Bridgewater Lakes when the surrounding landscape is dry and during drought conditions.
- supports > 1% of the population of the wetland dependent invertebrate species the Ancient greenling (*Hemiphysalia mirabilis*) in the Baumea sedgeland.

The area is popular for recreational and tourism activities, including sightseeing, walking, camping, and recreational fishing. Importantly, the Gunditjmara Indigenous people have a living association with the Ramsar site, which has great cultural significance for them, as it is part of their Koonang (sea) and Bocara Woorroarook (river forest) country. The ecological character of the site is defined by:

• Components:

- o Hydrology
- o Vegetation type and extent
- o Fish diversity and abundance
- o Waterbird diversity and abundance

• Process:

- o Stratification

• Services:

- o Special features (dune slacks)
- o Supports a diversity of wetland types
- o Supports threatened species
- o Provides physical habitat for waterbirds
- o Ecological connectivity.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Compiler 1

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2.1.2 - Period of collection of data and information used to compile the RIS

From year	1976
To year	2017

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Glenelg Estuary and Discovery Bay Ramsar Site
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2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image

<1 file(s) uploaded>

Former maps	0
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Boundaries description

The Glenelg Estuary and Discovery Bay Ramsar Site consists of:

- Seventeen crown land parcels of the Discovery Bay Coastal Park, namely:
 - o All of crown allotment 11 of Section 5 on Parish Plan PP3202;
 - o All of crown allotment 9 of Section A on Parish Plan PP2861;
 - o All of crown allotments 6A, 7A, 15A, 12A, 41B, 24C and 8 on Parish Plan PP3749;
 - o All of crown allotments 14A of Section A and 23A, 23B on Parish Plan PP2673;
 - o All of crown allotments 1B, 5, 6 and 7 of Section A on Parish Plan PP3553;
 - o All of crown allotment 12 of Section 9 on Parish Plan PP3553.
- All unallocated crown land bounded by the southward prolongation of the western boundary of crown allotment 23B on Parish Plan PP2673, the south-western boundaries of crown allotments 23B on Parish Plan PP2673, 8 on Parish Plan PP3749, 9 of Section A on Parish Plan PP2861, 11 of Section 5 on Parish Plan PP3202 and 5 of Section A on Parish Plan PP3553, the southern boundary of parcel 5 of Section A on Parish Plan PP3553 and the Mean Low Water Mark of the Southern Ocean.
- Three adjacent crown land parcels of the Glenelg River and Nelson Streamside Reserve, namely:
 - o All of crown allotment 44A on Parish Plan PP2673
 - o All of crown allotments 2A and 30A of Section 5 on Parish Plan PP5584
- Ten adjacent crown land parcels of the Lower Glenelg National Park west of the Winnap-Nelson Road, namely:
 - o All of crown allotments 1A, 38A and 41B on Parish Plan PP2055;
 - o All of crown allotment 5A on Parish Plan PP2673;
 - o All of crown allotment 17 of Section 5 on Parish Plan PP2861;
 - o All of crown allotment 23 on Parish Plan PP2884;
 - o All of crown allotment 17 on Parish Plan PP3365;
 - o All of crown allotment 49 and 2001 on Parish Plan PP3733;
 - o All of crown allotment 44 on Parish Plan PP3749.

The site excludes:

- All private land in the township of Nelson.
- Crown land of the Glenelg River estuary south of and including the Nelson to Portland Road and north of Oxbow Lake that is defined by crown allotment 30B of Section 5 on Parish Plan PP5584, crown allotments 36B, 36C and 36D on Parish Plan PP2673, and the Nelson-Portland Road defined by Vicmap road casement persistent feature identifier (PFI) 132491075.
- Unnamed government roads near Lake Monibeong Vicmap PFI 132493250, 132492162 and 132496176.
- All of allotment s 1, 1A, 2 and 3 of Section A on Parish Plan PP3553 adjacent to Bridgewater Lakes and unnamed government roads Vicmap PFI 132510790, 132492838 and 132500803.

2.2.2 - General location

a) In which large administrative region does the site lie?

b) What is the nearest town or population centre?

2.2.3 - For wetlands on national boundaries only

a) Does the wetland extend onto the territory of one or more other countries? Yes No

b) Is the site adjacent to another designated Ramsar Site on the territory of another Contracting Party? Yes No

2.2.4 - Area of the Site

Official area, in hectares (ha):

Area, in hectares (ha) as calculated from GIS boundaries

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Other scheme (provide name below)	South East Coast (Victoria) Drainage Division
Marine Ecoregions of the World (MEOW)	Temperate Australasia - Southeast Australasian shelf (56) - Western Bassian (206)

Other biogeographic regionalisation scheme

3 - Why is the Site important?

3.1 - Ramsar Criteria and their justification

- Criterion 1: Representative, rare or unique natural or near-natural wetland types

Other reasons

The Glenelg Estuary and Discover Bay Ramsar Site meets this criterion with respect to rare wetland types in the bioregion (and globally). The peatlands of the Ramsar site are fen wetlands (i.e. groundwater dependent) and largely have an intact hydrology. These are a rare wetland type globally, with nearby Piccaninnie Ponds Karst Wetlands Ramsar Site perhaps representing the only other significant fen wetland in the bioregion.

The site is geomorphically significant as it includes a humid dune slack system, which is rare in Australia. The dune slack system supports peatlands, wet grassland habitats and temporary pools, which are identified by the Ramsar Convention as globally significant (Ramsar Convention 2003).

The geomorphology and hydrology of the estuary section of the Ramsar site is unusual within the bioregion and can be considered a good representative of wetland type E. It is characterised by:

- being the longest estuary in Victoria (75 kilometres),
- having a groundwater dominated hydrology, and
- significant areas of limestone gorge for most of its length upstream of Nelson.

- Criterion 2 : Rare species and threatened ecological communities
- Criterion 4 : Support during critical life cycle stage or in adverse conditions
- Criterion 8 : Fish spawning grounds, etc.

Justification

The Glenelg Estuary provides nursery habitat for several species of recreationally important fish including black bream (*Acanthopagrus butcheri*) and estuary perch (*Macquaria colonorum*). In particular, the seasonal opening and closing of the estuary is considered important in providing conditions for spawning of black bream (Jenkins et al. 2008).

In addition, the site supports at least 14 species of fish that migrate between habitats for parts of their lifecycle including: short finned eel (*Anguilla australis*), tupong (*Pseudaphritis urvillii*), estuary perch (*Macquaria colonorum*) and common galaxias (*Galaxias maculatus*). A recent tagging study has indicated that mullocky that feed in the Glenelg Estuary may migrate up to 400 kilometres to the Murray Mouth to spawn (Lieschke and Stoessel, in prep.).

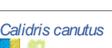
The site provides a range of fish species with sources of food, spawning grounds and nurseries, and acts as a migration path on which diadromous fishes of the region depend, as such it is deemed to meet this criterion.

- Criterion 9 : >1% non-avian animal population

3.2 - Plant species whose presence relates to the international importance of the site

Scientific name	Common name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
<i>Prasophyllum frenchii</i> 	maroon leek orchid	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	National (EPBC) - Endangered	
<i>Pterostylis tenuissima</i> 	swamp greenhood	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	National (EPBC) - Endangered	

3.3 - Animal species whose presence relates to the international importance of the site

Phylum	Scientific name	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
Birds																		
CHORDATA/AVES	 <i>Actitis hypoleucos</i>	Common Sandpiper	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Arenaria interpres</i>	Ruddy Turnstone	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		International International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Botaurus poiciloptilus</i>	Australasian Bittern	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN 	<input type="checkbox"/>	<input type="checkbox"/>	National (EPBC) - Endangered	
CHORDATA/AVES	 <i>Calidris acuminata</i>	Sharp-tailed Sandpiper	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Calidris alba</i>	Sanderling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Calidris canutus</i>	Red Knot	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT 	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Calidris ferruginea</i>	Curlew Sandpiper	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT 	<input type="checkbox"/>	<input type="checkbox"/>	National (EPBC) - Critically Endangered	International migratory shorebird that spends non-breeding season in Australia. and uses the site as habitat. Younger non-breeding birds may remain at the site during the breeding season
CHORDATA/AVES	 <i>Calidris ruficollis</i>	Red-necked Stint	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT 	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Calidris tenuirostris</i>	Great Knot	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN 	<input type="checkbox"/>	<input checked="" type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Charadrius leschenaultii</i>	Greater Sand Plover; Greater Sand-Plover	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Charadrius veredus</i>	Oriental Plover	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Gallinago hardwickii</i>	Latham's Snipe	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Limicola falcinellus</i>	Broad-billed Sandpiper	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Limosa lapponica</i>	Bar-tailed Godwit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT 	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Limosa limosa</i>	Black-tailed Godwit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT 	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Numenius madagascariensis</i>	Eastern Curlew; Far Eastern Curlew	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	National (EPBC) - Critically Endangered	International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Pluvialis fulva</i>	Pacific Golden Plover	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	 <i>Pluvialis squatarola</i>	Grey Plover; Black-bellied Plover	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat

Phylum	Scientific name	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence ¹⁾	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
CHORDATA/AVES	<i>Sternula nereis nereis</i>	Fairy tern	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	National (EPBC) - Vulnerable	Breeding recorded within the site
CHORDATA/AVES	<i>Thinornis rubricollis</i>	hooded plover	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	National (EPBC) - Vulnerable	
CHORDATA/AVES	<i>Tringa brevipes</i>	Gray-tailed Tattler; Grey-tailed Tattler	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	<i>Tringa nebularia</i>	Common Greenshank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	<i>Tringa stagnatilis</i>	Marsh Sandpiper	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
CHORDATA/AVES	<i>Xenus cinereus</i>	Terek Sandpiper	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		International migratory shorebird that spends non-breeding season in Australia and uses the site as habitat
Fish, Mollusc and Crustacea																		
CHORDATA/ACTINOPTERYGII	<i>Aldrichetta forsteri</i>	Yelloweyed mullet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA/ACTINOPTERYGII	<i>Anguilla australis</i>	Shortfin eel; Shortfin eel; Shortfin eel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA/ACTINOPTERYGII	<i>Atherinosoma microstoma</i>	Small-mouth hardyhead; Smallmouth hardyhead; Fanged hardyhead; Greyback; Endora's hardyhead	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA/ACTINOPTERYGII	<i>Galaxiella pusilla</i>	Eastern little galaxias	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				VU	<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA/CEPHALASPIDOMORPHI	<i>Geotria australis</i>	Pouched lamprey; Pouched lamprey; Pouched lamprey; Wide-mouthed lamprey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA/ACTINOPTERYGII	<i>Liza argentea</i>	Flat-tailed mullet; Jumping mullet; Ramsay's grey mullet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA/CEPHALASPIDOMORPHI	<i>Mordacia mordax</i>	Australian lamprey; Australian lamprey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA/ACTINOPTERYGII	<i>Mugil cephalus</i>	Sea mullet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA/ACTINOPTERYGII	<i>Myxus elongatus</i>	Sand grey mullet; Sand grey mullet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA/ACTINOPTERYGII	<i>Nannoperca obscura</i>	Yarra pygmy perch; Yarra pygmy perch	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				VU	<input type="checkbox"/>	<input type="checkbox"/>	National (EPBC) - Vulnerable	
CHORDATA/ACTINOPTERYGII	<i>Pseudaphritis urvillii</i>	Tupong	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		
Others																		

Phylum	Scientific name	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence ¹⁾	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
ARTHROPODA/ INSECTA	<i>Hemiphysalis mirabilis</i>	Ancient Greenling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10985000	2013	54925	EN ●●● ●●●	<input type="checkbox"/>	<input type="checkbox"/>	National (EPBC) - Vulnerable	>5% estimate of total population
CHORDATA/ AMPHIBIA	<i>Litoria raniformis</i>	growing grass frog	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN ●●● ●●●	<input type="checkbox"/>	<input type="checkbox"/>	National (EPBC) - Vulnerable	Breeding recorded within the site
CHORDATA/ MAMMALIA	<i>Miniopterus schreibersii bassanii</i>	southern bent wing bat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	National (EPBC) - Critically Endangered	

1) Percentage of the total biogeographic population at the site

Additional information on Ancient Greenling: Pop size: 1 500 000 to 10 985 000 (2013); >5% estimate of total population. The population estimate provided for Ancient Greenling is for the sub-population present at Long Swamp. It is the largest sub-population known for the species from the 19 known localities, of which all are isolated.

Justification on criteria 8: The Glenelg Estuary provides nursery habitat for several species of recreationally important fish including black bream (*Acanthopagrus butcheri*) and estuary perch (*Macquaria colonorum*). In particular, the seasonal opening and closing of the estuary is considered important in providing conditions for spawning of black bream (Jenkins et al. 2008). In addition, the site supports at least 14 species of fish that migrate between habitats for parts of their lifecycle including: short finned eel (*Anguilla australis*), tupong (*Pseudaphritis urvillii*), estuary perch (*Macquaria colonorum*) and common galaxias (*Galaxias maculatus*). A recent tagging study has indicated that mullocky that feed in the Glenelg Estuary may migrate up to 400 kilometres to the Murray Mouth to spawn (Lieschke and Stoessel, in prep.). The site provides a range of fish species with sources of food, spawning grounds and nurseries, and acts as a migration path on which diadromous fishes of the region depend, as such it is deemed to meet this criterion.

3.4 - Ecological communities whose presence relates to the international importance of the site

Name of ecological community	Community qualifies under Criterion 2?	Description	Justification
Subtropical and Temperate Coastal Saltmarsh	<input checked="" type="checkbox"/>	The Coastal Saltmarsh ecological community consists mainly of salt-tolerant vegetation (halophytes) including: grasses, herbs, sedges, rushes and shrubs. Succulent herbs, shrubs and grasses generally dominate.	Community is listed as vulnerable under the EPBC Act.

4 - What is the Site like? (Ecological character description)

4.1 - Ecological character

Ecological character at the Ramsar site is defined by a number of critical components, processes and services:

Hydrology - a complex interaction of surface and groundwater expression as well as local rainfall-runoff, particularly in the freshwater wetland and estuary management units. System hydrology is crucial to the functioning of the estuary, and the freshwater wetlands that include ecologically important fens. Freshwater surface inflows are highly variable both seasonally and over longer climatic cycles.

Vegetation type and extent – specific vegetation communities are associated with each wetland type in the system. Dune scrub vegetation is important in stabilising the dune system; coastal saltmarsh occurs at Oxbow Lake; freshwater sedgeland and tall marsh are characteristic of the Long Swamp wetlands and there are significant submerged macrophyte communities in the permanent lakes.

Fish diversity and abundance - 47 native fish species from 26 families at the site have been recorded from the site, with 28 of these species considered regularly supported. Most common species (in terms of abundance) are the estuarine species small-mouthed hardy-head (*Atherinosoma microstoma*) and black bream (*Acanthopagrus butcheri*) common in Oxbow Lake, and the freshwater species southern pygmy perch (*Nannoperca australis*) dominating the community in Long Swamp. The common galaxias (*Galaxias maculatus*) is a self-sustaining breeding population within the site. A number of fish species move between habitats during different parts of their lifecycles. There is a good understanding of the spawning and recruitment of black bream in the Glenelg Estuary, with stratification and freshwater inflows important for success.

Waterbird diversity and abundance - A total of 95 waterbird species have been recorded within the Ramsar site, 24 of which are listed under international migratory agreements. There are breeding records of nine waterbird species from within the site, dominated by beach nesting species.

Stratification - the lower Glenelg Estuary is a seasonally closed salt-wedge estuary and the stratification (distinct layers of fresh and saline water) is important for maintaining recruitment in several fish species, including the recreationally important black bream.

Diversity of wetland types - the site comprises a network of interconnected wetland types including freshwater permanent wetlands, intermittently inundated marshes, estuarine waters and intertidal sandy beaches.

Special geomorphic features - the site is significant for a number of geological and geomorphic features; in particular the dune slack system is rare, if not unique within the bioregion.

Physical habitat for waterbirds - the site provides a network of habitats for waterbird feeding, roosting and breeding. Species that are supported by the site represent a wide range of functional groups (e.g. fishers, waders, ducks) each with different habitat requirements.

Threatened wetland species and ecosystems - one nationally listed ecological community and eight nationally or internationally listed species of conservation significance are supported by the site.

Ecological connectivity - the wetlands in the site are hydrologically and ecologically connected. The connection between the marine, estuarine and freshwater components is particularly important for fish migration and reproduction.

4.2 - What wetland type(s) are in the site?

Marine or coastal wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
B: Marine subtidal aquatic beds (Underwater vegetation)	Glenelg estuary	4	1	
E: Sand, shingle or pebble shores	Discovery bay	2	1575	Rare
F: Estuarine waters	Glenelg estuary	1	4680	
G: Intertidal mud, sand or salt flats		4	3	
H: Intertidal marshes		4	35.5	

Inland wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
Fresh water > Flowing water >> N: Seasonal/intermittent/irregular rivers/streams/creeks	Outlet creek	4	1	
Fresh water > Lakes and pools >> O: Permanent freshwater lakes	Bridgewater lakes north and south, Lake Moniboeng	3	113	
Saline, brackish or alkaline water > Marshes & pools >> Ss: Seasonal/intermittent saline/brackish/alkaline marshes/pools		4	20	
Fresh water > Marshes on inorganic soils >> Tp: Permanent freshwater marshes/pools		4	69	
Fresh water > Marshes on inorganic soils >> Ts: Seasonal/intermittent freshwater marshes/pools on inorganic soils		4	10	
Fresh water > Marshes on peat soils >> U: Permanent Non-forested peatlands	Long swamp depressions	2	946	Rare

(ECD) Habitat connectivity

Aspects of ecological connectivity considered critical to the character of the Ramsar site include pathways for migratory fish, particularly for diadromous fish, and interconnected habitat for waterbirds.

4.3 - Biological components

4.3.1 - Plant species

Optional text box to provide further information

A number of problematic native plant species are known to occur in both the Lower Glenelg National Park and Discovery Bay Coastal Park areas in areas included in the Ramsar site. While native species, they are problematic because of their vigorous growth and ability to displace other native plants, thus reducing vegetation diversity. Problematic species include coast wattle (*Acacia longifolia* var. *sophorae*), spiny rush (*Juncus acutus*) and beach daisy (*Arctotheca populifolia*).

4.3.2 - Animal species

Invasive alien animal species

Phylum	Scientific name	Common name	Impacts
CHORDATA/ACTINOPTERYGII	<i>Cyprinus carpio</i>	Common carp	Potentially
CHORDATA/ACTINOPTERYGII	<i>Gambusia holbrooki</i>	Eastern Gambusia	Actually (minor impacts)
CHORDATA/ACTINOPTERYGII	<i>Perca fluviatilis</i>	Redfin perch	Actually (minor impacts)
CHORDATA/ACTINOPTERYGII	<i>Tinca tinca</i>	Green tench	Actually (minor impacts)
CHORDATA/MAMMALIA	<i>Vulpes vulpes</i>	Red Fox	Actually (minor impacts)

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
C: Moist Mid-Latitude climate with mild winters	Cfb: Marine west coast (Mild with no dry season, warm summer)

Climate change has the potential to affect CPS by changes in temperature, rainfall, evaporation, sea levels and ocean pH. These changes can affect wetland vegetation diversity and extent, fish and waterbird populations and estuary stratification, which in turn can affect fish and associated services such as food production, as well as threatened species via loss or degradation of habitat. Specific climate change predictions for the region are for (CSIRO 2016):

- Increased average temperatures in all seasons
- More hot days and warm spells and a reduction in the number of frosts
- Less spring and winter rainfall
- Increased intensity of extreme rainfall events
- Continued rise in mean sea level and increased extreme sea-level events
- A harsher fire-weather climate.

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres)

a) Maximum elevation above sea level (in metres)

- Entire river basin
- Upper part of river basin
- Middle part of river basin
- Lower part of river basin
- More than one river basin
- Not in river basin
- Coastal

Please name the river basin or basins. If the site lies in a sub-basin, please also name the larger river basin. For a coastal/marine site, please name the sea or ocean.

Glenelg River Basin flowing into Southern Ocean

4.4.3 - Soil

- Mineral
- Organic
- No available information

Are soil types subject to change as a result of changing hydrological conditions (e.g., increased salinity or acidification)? Yes No

Please provide further information on the soil (optional)

Long Swamp complex is characterised by soils that are peat, calcareous and alkaline. The Discovery Bay land system is characterised by steep dunes of highly calcareous sands made up largely of finely broken sea shells. The soils are mineral, with increasing organic material inland from the sea. These soils have been described as unique, with high alkalinity. The sediments within the lower estuary are medium to very fine sands.

4.4.4 - Water regime

Water permanence

Presence?
Usually permanent water present
Usually seasonal, ephemeral or intermittent water present

Source of water that maintains character of the site

Presence?	Predominant water source
Water inputs from rainfall	<input type="checkbox"/>
Water inputs from surface water	<input checked="" type="checkbox"/>
Water inputs from groundwater	<input checked="" type="checkbox"/>
Marine water	<input checked="" type="checkbox"/>

Water destination

Presence?
To downstream catchment
Marine

Stability of water regime

Presence?
Water levels largely stable
Water levels fluctuating (including tidal)

Please add any comments on the water regime and its determinants (if relevant). Use this box to explain sites with complex hydrology.

While a knowledge and quantification of ecosystem water regimes is limited, it is understood that many of the wetlands in the site, including the Glenelg Estuary are groundwater dependent. It is suspected that groundwater is a significant water source for these systems, at times contributing more than surface water sources. The hydrology of the Glenelg Estuary is influenced by the tidal cycle, when the estuary is open and freshwater river inflows, the latter of which are seasonal. A range of wetland water regimes are present and several of the wetlands, such as the Bridgewater Lakes are permanently inundated.

(ECD) Connectivity of surface waters and of groundwater	The site is highly groundwater dependent with surface expressions of groundwater in large parts of the site.
(ECD) Stratification and mixing regime	The Glenelg Estuary is a salt wedge estuary. Stratification commonly occurs where low density fresh water flows over the top of dense saline water without mixing, forming a salt wedge on the estuary floor.

4.4.5 - Sediment regime

- Significant erosion of sediments occurs on the site
- Significant accretion or deposition of sediments occurs on the site
- Significant transportation of sediments occurs on or through the site
- Sediment regime is highly variable, either seasonally or inter-annually
- Sediment regime unknown

Please provide further information on sediment (optional):

The Glenelg Estuary is an east facing, intermittently closed and open lagoon (ICOL) that is seasonally closed. Sand deposition during low flow periods forms a bar across the mouth, isolating the system from the ocean. Land clearing and subsequent runoff and erosion in the Glenelg River catchment has resulted in large amounts of sediments moving into the river channel. It is estimated that between 10 000 and 50 000 cubic metres of sand has been deposited per kilometre of channel, causing significant sand slugs and bars upstream of the Ramsar site.

(ECD) Water turbidity and colour	Glenelg Estuary - turbidity is generally less than the detection limit, but can exceed 100 NTU on occasions.
(ECD) Light - reaching wetland	No current data available on this aspect of the character of the site.
(ECD) Water temperature	No current data available on this aspect of the character of the site.

4.4.6 - Water pH

- Acid (pH<5.5)
- Circumneutral (pH: 5.5-7.4)
- Alkaline (pH>7.4)
- Unknown

Please provide further information on pH (optional):

The Lower Glenelg Estuary is neutral to slightly alkaline, with median pH 8. The water in Lake Bridgewater is neutral to slightly alkaline (pH, 7.7 – 8.9). Water quality in the majority of the Long Swamp complex wetlands is alkaline, with pH > 8.

4.4.7 - Water salinity

- Fresh (<0.5 g/l)
- Mxohaline (brackish)/Mxosaline (0.5-30 g/l)
- Euhaline/Eusaline (30-40 g/l)
- Hyperhaline/Hypersaline (>40 g/l)
- Unknown

Please provide further information on salinity (optional):

Glenelg Estuary: the interaction of fresh river flow and saline marine tides creates a salt wedge within the estuary, comprising described three distinct layers (Barton and Sherwood 2004):

- Upper layer of fresh, river water constantly flowing downstream;
- Lower layer of denser saline water, moving upstream on the flood tide and downstream on the ebb tide; and
- A middle mixed layer of intermediate density that moves downstream with the freshwater layer, gradually thickening until the freshwater layer disappears.

Long Swamp complex: Fresh water with salinity generally less than 0.5 ppt.

(ECD) Dissolved gases in water

Stratification in the Glenelg Estuary can lead to very low oxygen levels which may impact on ecosystem functions such as nutrient cycling as well as influence obligate aquatic biota.

4.4.8 - Dissolved or suspended nutrients in water

- Eutrophic
- Mesotrophic
- Oligotrophic
- Dystrophic
- Unknown

Please provide further information on dissolved or suspended nutrients (optional):

Glenelg Estuary – evidence from both within the site and upstream indicate moderate to high levels of nitrogen and phosphorus. Lake Bridgewater – very low levels of nitrogen and phosphorus.

(ECD) Dissolved organic carbon	No current data available on this aspect of the character of the site.
(ECD) Redox potential of water and sediments	No current data available on this aspect of the character of the site.
(ECD) Water conductivity	No current data available on this aspect of the character of the site.

4.4.9 - Features of the surrounding area which may affect the Site

Please describe whether, and if so how, the landscape and ecological characteristics in the area surrounding the Ramsar Site differ from the i) broadly similar ii) significantly different site itself.

- Surrounding area has greater urbanisation or development
- Surrounding area has higher human population density
- Surrounding area has more intensive agricultural use
- Surrounding area has significantly different land cover or habitat types

Please describe other ways in which the surrounding area is different:

The Ramsar site is located predominantly within the Lower Glenelg National Park and Discovery Bay Coastal Parks, which are managed for conservation. Major land uses adjacent to the site include extensive forestry (primarily pine plantations) and grazing of improved and natural pastures. The Ramsar site includes a range of freshwater and estuarine wetlands and coastal and dune systems. The surrounding landscape is largely terrestrial.

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Food for humans	Sustenance for humans (e.g., fish, molluscs, grains)	Medium
Genetic materials	Genes for tolerance to certain conditions (e.g., salinity)	Low

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Maintenance of hydrological regimes	Groundwater recharge and discharge	Medium
Erosion protection	Soil, sediment and nutrient retention	Medium

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Recreational hunting and fishing	High
Recreation and tourism	Water sports and activities	High
Recreation and tourism	Picnics, outings, touring	High
Recreation and tourism	Nature observation and nature-based tourism	High
Spiritual and inspirational	Spiritual and religious values	High
Spiritual and inspirational	Aesthetic and sense of place values	Medium
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	Medium

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part	High
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	Medium

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site? Yes No Unknown

4.5.2 - Social and cultural values

- i) the site provides a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland
- ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland
- iii) the ecological character of the wetland depends on its interaction with local communities or indigenous peoples
- iv) relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland

<no data available>

4.6 - Ecological processes

(ECD) Primary production	Not critical to the character of the site, but plays an important role as a supporting service, underpinning food webs within the system.
(ECD) Nutrient cycling	Not critical to the character of the site, but is believed to play an important role in biogeochemical process, although this remains a knowledge gap for parts of the site.
(ECD) Carbon cycling	No current data available on this aspect of the character of the site.
(ECD) Animal reproductive productivity	No current data available on this aspect of the character of the site.
(ECD) Vegetational productivity, pollination, regeneration processes, succession, role of fire, etc.	No current data available on this aspect of the character of the site.
(ECD) Notable species interactions, including grazing, predation, competition, diseases and pathogens	See the ecological character description for further details.
(ECD) Notable aspects concerning animal and plant dispersal	See the ecological character description for further details.
(ECD) Notable aspects concerning migration	The connection between the marine, estuarine and freshwater components is significant for fish migration and reproduction.

5 - How is the Site managed? (Conservation and management)

5.1 - Land tenure and responsibilities (Managers)

5.1.1 - Land tenure/ownership

Public ownership

Category	Within the Ramsar Site	In the surrounding area
Provincial/region/state government	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Private ownership

Category	Within the Ramsar Site	In the surrounding area
Other types of private/individual owner(s)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Provide further information on the land tenure / ownership regime (optional):

The Ramsar site falls predominantly within the Lower Glenelg National Park and the Discovery Bay Coastal Park. Both the National Park and Coastal Park are managed by Parks Victoria in partnership with local stakeholders. The Gunditjmarra people hold Native Title rights over this Crown land. Management of the Ramsar site recognizes their rights and interests and traditional connection to their lands.

5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:

Parks Victoria

Provide the name and title of the person or people with responsibility for the wetland:

Don Tumney, Area Chief Ranger

Postal address:

PO Box 471, Portland, 3305

E-mail address:

don.turnney@parks.vic.gov.au

5.2 - Ecological character threats and responses (Management)

5.2.1 - Factors (actual or likely) adversely affecting the Site's ecological character

Human settlements (non agricultural)

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Housing and urban areas	Low impact	Medium impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Tourism and recreation areas	Low impact	Medium impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Water abstraction	Medium impact	High impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Wood and pulp plantations	Low impact	Medium impact	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Livestock farming and ranching	Low impact	Low impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Energy production and mining

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Oil and gas drilling	Low impact	Medium impact	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Biological resource use

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Fishing and harvesting aquatic resources	Medium impact	Medium impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Human intrusions and disturbance

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Recreational and tourism activities	High impact	High impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Dams and water management/use	High impact	High impact	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fire and fire suppression	Medium impact	High impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Invasive and other problematic species and genes

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Problematic native species	High impact	High impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Invasive non-native/ alien species	High impact	High impact	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Garbage and solid waste	Low impact	Medium impact	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Agricultural and forestry effluents	Low impact	Medium impact	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Industrial and military effluents	Low impact	High impact	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Droughts	Medium impact	High impact	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Storms and flooding	Medium impact	High impact	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Please describe any other threats (optional):

The management plan for the site identified the following high priority threats:

- Invasive species: non-native non-woody weeds (e.g. phalaris, Sicilian sea lavender)
- Invasive species: native woody weeds (e.g. coastal wattle)
- Invasive species: non-native woody weeds (e.g. boxthorn)
- Invasive species: non-native terrestrial animals (e.g. pigs, foxes)
- Invasive species: non-native aquatic animals (e.g. carp)
- Energy production and mining: oil and gas drilling: decreased groundwater levels
- Natural systems modification (e.g. inappropriate estuary openings): altered water regimes
- Natural systems modifications (wildfire): increased nutrients and sediments
- Climate change (sea level rise): increased ingress of marine water
- Climate change (extreme storm events): increased beach erosion
- Climate change (drought): altered water regimes

5.2.2 - Legal conservation status

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
State Protected Area (Mc)	Lower Glenelg National Park	http://parkweb.vic.gov.au/exploration/parks/lower-glenelg-national-park	partly
State Protected Area (Mc)	Nelson Streamside Reserve	http://parkweb.vic.gov.au/exploration/parks/nelson-ss.r	whole
State Protected Area (Mc)	Discovery Bay Coastal Park	http://parkweb.vic.gov.au/exploration/parks/discovery-bay-coastal-park	partly

5.2.3 - IUCN protected areas categories (2008)

- Ia Strict Nature Reserve
- Ib Wilderness Area: protected area managed mainly for wilderness protection
- II National Park: protected area managed mainly for ecosystem protection and recreation
- III Natural Monument: protected area managed mainly for conservation of specific natural features
- IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention
- V Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation

VI Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems

5.2.4 - Key conservation measures

Legal protection

Measures	Status
Legal protection	Implemented

Habitat

Measures	Status
Catchment management initiatives/controls	Partially implemented
Improvement of water quality	Partially implemented
Hydrology management/restoration	Partially implemented
Re-vegetation	Partially implemented

Species

Measures	Status
Control of invasive alien plants	Partially implemented
Control of invasive alien animals	Partially implemented
Threatened/rare species management programmes	Partially implemented

Human Activities

Measures	Status
Regulation/management of recreational activities	Partially implemented
Communication, education, and participation and awareness activities	Proposed
Research	Partially implemented
Management of water abstraction/takes	Implemented
Regulation/management of wastes	Implemented
Fisheries management/regulation	Implemented

Other:

In Australia, the ecological character of a designated Ramsar site is protected as a Matter of National Environmental Significance (MNES) under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

5.2.5 - Management planning

Is there a site-specific management plan for the site? Yes

Has a management effectiveness assessment been undertaken for the site? Yes No

If the site is a formal transboundary site as indicated in section Data and location > Site location, are there shared management planning processes with another Contracting Party? Yes No

URL of site-related webpage (if relevant):

5.2.6 - Planning for restoration

Is there a site-specific restoration plan? No need identified

5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Water regime monitoring	Implemented
Water quality	Proposed
Plant community	Proposed
Animal community	Implemented
Birds	Implemented

There are several monitoring programs in place:

Estuary Watch – monitors estuary opening and closing in the Glenelg Estuary.

Nature Glenelg Trust – monitors fish populations in the Long Swamp complex and lower Glenelg Estuary.

BirdLife Australia – monitors shorebirds in the beach and estuary portions of the Ramsar site and has a biennial beach nesting bird monitoring program.

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

Butcher, R., Hale, J., Books, S. and Cottingham, P. (2016a). Ecological Character Description for Glenelg Estuary and Discovery Bay Ramsar Site. Report to the Glenelg Hopkins Catchment Management Authority.

Cordero-Rivera A. (2015). Demographics and adult activity of *Hemiphysalis mirabilis*: a short-lived species with a huge population size (Odonata: Hemiphysalidae). *Insect Conservation and Diversity*.

Cordero Rivera A. (2014). Behaviour and ecology of *Hemiphysalis mirabilis* (Odonata: Hemiphysalidae). Report on the work done in Victoria during November and December 2013.

Duncan M. (2010). National Recovery Plan for the Maroon Leek-orchid *Prasophyllum frenchii*. Victorian Government Department of Sustainability and Environment (DSE) Melbourne.

Dickson C.R., Anderson R.A., Murphy A., Pritchard A. and Craig A. (2012). Recovery Plan for three orchid species in South Australia and Victoria: *Caladenia richardsiorum* (little dip spider-orchid), *Caladenia calcicola* (limestone spider-orchid) and *Pterostylis tenuissima* (swamp greenhood). Department of Environment, Water and Natural Resources, South Australia, South East Region & Department of Sustainability and Environment, Victoria, South West Victoria Region.

Ewers C., Esbert N., Hardie M., Ekanayake K., Cullen M. and Maguire G.S. (2011). Report on the 2010 Biennial Hooded Plover Count, Birds Australia.

Glenelg Hopkins CMA (2014). Glenelg Hopkins Waterway Strategy. Glenelg Hopkins Catchment Management Authority, Hamilton.

Glenelg Hopkins CMA (2013). Glenelg Hopkins Regional Catchment Strategy. Glenelg Hopkins Catchment Management Authority, Hamilton.

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Glenelg Hopkins CMA (2006b). Glenelg Hopkins Fishery Management Plan, Glenelg Hopkins Catchment Management Authority, Hamilton, Victoria.

Mead R., Yarwood M., Cullen M., and Maguire G. (2012). Report on the 2012 Biennial Hooded Plover count. BirdLife.

Parks Victoria (2015). Ngootyoong Gunditj Ngootyoong Mara South West Management Plan. Parks Victoria, Melbourne.

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)

<no file available>

ii. a detailed Ecological Character Description (ECD) (in a national format)

<1 file(s) uploaded>

iii. a description of the site in a national or regional wetland inventory

<no file available>

iv. relevant Article 3.2 reports

<no file available>

v. site management plan

<1 file(s) uploaded>

vi. other published literature

<1 file(s) uploaded>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:



Glenelg River Estuary as viewed from the Beach Road lookout, the opening to the ocean can be seen at far right. (Andrea White, 01-11-2013)



Coastal dune scrub on the barrier dunes adjacent to Long Swamp and shorebird habitat along the ocean beach. (Andrea White, 01-11-2013)



Lake Mmbeong one of the freshwater lakes of Discovery Bay (Andrea White, 01-11-2013)

6.1.4 - Designation letter and related data

Designation letter

<1 file(s) uploaded>

Date of Designation 2018-02-28