



Ramsar Information Sheet

Published on 15 December 2025

Update version, previously published on : 1 January 1998

Australia

Western Port



Designation date	15 December 1982
Site number	267
Coordinates	38°21'25"S 145°20'53"E
Area	59 297,00 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 Wetland of International Importance, is located 60 kilometres southeast of Melbourne and comprises a large proportion of the Western Port embayment to the north of Phillip Island. The Site consists of large shallow intertidal areas, dissected by deeper channels and covers approximately 60,000 hectares. It includes a number of small islands including Quail, Elizabeth and Ram Islands and the southern tip of French Island known as Tortoise Head.

The Site is internationally significant for the extensive shorebird feeding and roosting habitat provided by the intertidal mudflats, seagrass and saltmarsh areas. It supports large numbers of migratory waders as well as Australian waterbirds such black swans, large wading birds, ducks and fish-eating species. The sand beaches provide important nesting habitat for beach nesting birds such as the Australian fairy tern, oystercatchers and red-capped plovers. The Site regularly supports several nationally threatened wetland species and 1% of the individuals in a population of six wetland species.

The Site contains extensive areas of intertidal mud flats, mangroves and the nationally threatened ecological community coastal saltmarsh as well as seagrass beds. As such the site has significant blue carbon values. Mangroves and seagrass beds provide important habitat for a diversity of fish species. The Site is a key breeding area for some fish species and also supports a number of fish species that migrate between fresh, estuarine and marine waters as part of their life cycles.

One of the outstanding characteristics of the soft-sediment fauna of Western Port is the high diversity of ghost shrimp, which includes rare species such as *Pseudocalliax tooradin*, and *Michelea microphylla*, a local endemic found only at Crib Point. Rocky reefs comprise a small area of the Site, but also contribute to the high diversity of invertebrates. The reefs at San Remo support a high diversity of one invertebrate group — opisthobranchs (sea-slugs and sea-hares). In addition, Crawfish Rock is considered especially diverse and supports the endemic *Ralpharia coccinea*.

Western Port has the following critical components, processes and services; wetland bathymetry, geomorphology and sedimentation, flora (seagrass, mangrove and saltmarsh), fauna (waterbirds, fish and marine invertebrates) and supporting threatened species.

The Site meets 7 criteria; 1, 2, 3, 4, 5, 6 and 8.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Responsible compiler

Institution/agency	Department of Environment, Land, Water and Planning
Postal address	8 Nicholson St, East Melbourne, Victoria 3002

National Ramsar Administrative Authority

Institution/agency	Department of Climate Change, Energy, the Environment and Water
Postal address	GPO Box 3090 Canberra ACT 2601 Australia

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

From year	2000
To year	2019

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Western Port
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2.1.4 - Changes to the boundaries and area of the Site since its designation or earlier update

(Update) A. Changes to Site boundary	Yes ☒ No ☐
(Update) The boundary has been delineated more accurately	☒
(Update) The boundary has been extended	☐
(Update) The boundary has been restricted	☐
(Update) B. Changes to Site area	No change to area
(Update) For secretariat only: This update is an extension	☐

2.1.5 - Changes to the ecological character of the Site

(Update) 6b i. Has the ecological character of the Ramsar Site (including applicable Criteria) changed since the previous RIS?	Uncertain
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(Update) Optional text box to provide further information

There has been a reassessment of the wetland types that occur at the Site in acknowledgement that the Interim Biogeographic Regionalisation for Australia was incorrectly used as the framework for assessing criterion 1. As such there has been a reassessment of the wetland types that occur at the Site. As a consequence, Western Port does not support two wetland types identified in the Ecological Character Description (Kellogg, Brown and Root (2010)): rocky marine shores (D) and estuarine waters (F).

Waterbird monitoring indicates a decline in total abundance in recent years (since 2014), but waterbird abundance has been highly variable over the past 50 years that data is available, so it is unclear if this is a sustained trend. There have been declines in several international migratory shorebirds including the eastern curlew (critically endangered EPBC, endangered IUCN) and lesser sand plover (endangered EPBC). The decline in these species and in international migrants at the Site is most likely due to pressures elsewhere in the flyway. This is supported by continued abundances of Australian resident shorebirds in the Site (data from BirdLife Australia) which utilise the same habitat.

There has also been a decline in the fairy tern at the Site. The species is also listed as threatened (Vulnerable EPBC and IUCN Red List) and it is not known if the reasons for decline are based on site factors or factors outside the site. BirdLife Australia currently is conducting a multi-year investigation into the fairy tern including within the Site. The results are not yet available (Amy Adams, BirdLife Australia, personal communication).

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 Site is located 60 kilometres southeast of Melbourne and comprises a large proportion of the Western Port embayment to the north of Phillip Island. It consists of large shallow intertidal areas, dissected by deeper channels and includes Quail Island and the southern tip of French Island known as Tortoise Head. The main body of French Island is excluded. A full description of the boundary is provided in section 6.1.2 vi.

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
Marine Ecoregions of the World (MEOW)	Southeast Australian Shelf
Other scheme (provide name below)	Bass Strait province
Other scheme (provide name below)	Drainage division 2: South East Coast

Other biogeographic regionalisation scheme

- Bass Strait Province - Marine and Coastal Regionalisation of Australia (IMCRA)
- Drainage Division: South East Coast Victoria (Australian Hydrological Geospatial Framework)

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

Western Port is situated in the Bass Strait Integrated Marine and Coastal Regionalisation of Australia Province bioregion which extends from Apollo Bay to Waratah Bay in Victoria including Port Phillip Bay and Western Port, the entire north coast of Tasmania and the waters between. Although there is not a complete inventory of wetlands and coastal ecosystems across the bioregion, there is evidence to suggest that Western Port contains good representative examples of wetland types: B (Marine subtidal aquatic beds (Underwater vegetation)), G (intertidal mud, sand or salt flats); H (intertidal marshes) and I (intertidal forested wetlands).

The extensive areas of saltmarsh and mangroves within the Site (wetland types H and I) are considered to be in good condition (Boon et al. 2011). These wetlands types are important habitat for migratory waterbirds and nursery habitat for fish and invertebrates. They also stabilise and accumulate sediment and are important in erosion protection, nutrient cycling and filters pollutants

As the basis for assessing criterion 1, Kellogg, Brown and Root (2010) used Interim Biogeographic Regionalisation for Australia, whereas the Integrated Marine and Coastal Regionalisation of Australia is the appropriate framework for marine wetlands such as Western Port (DSEWPaC 2012). As a result, there has been a reassessment of the wetland types that occur in the Site. The Site does not support two wetland types in Kellogg, Brown and Root (2010): rocky marine shores (D) and estuarine waters (F).

☒ Criterion 2 : Rare species and threatened ecological communities

Optional text box to provide further information

The Site regularly supports one threatened ecological community and ten threatened fauna species:

- Bar-tailed godwit (*Limosa lapponica baueri*) – nationally endangered
- Curlew sandpiper (*Calidris ferruginea*) – nationally critically endangered; IUCN Red list
- Coastal saltmarsh – nationally listed vulnerable ecological community
- Australian fairy tern (*Sternula nereis nereis*) – nationally vulnerable; IUCN Red list
- Eastern curlew (*Numenius madagascariensis*) – nationally critically endangered; IUCN Red list
- Lesser sand plover (*Charadrius mongolus*) – nationally endangered; IUCN Red list
- Red knot (*Calidris canutus*) – nationally vulnerable
- Australian grayling (*Prototroctes maraena*) – nationally vulnerable; IUCN Red list
- Ruddy Turnstone (*Arenaria interpres*) - nationally vulnerable
- Sharp-tailed Sandpiper (*Calidris acuminata*) - nationally vulnerable; IUCN Red list
- Common Greenshank (*Tringa nebularia*) - nationally endangered

The Site also supports the IUCN red-listed school shark.

The Site is particularly important for the Eastern Curlew and Curlew sandpiper which are international migratory species which spend the non-breeding period in the southern hemisphere, arriving in late spring and spending the summer months feeding on invertebrates in intertidal mudflats (including Western Port). They are both listed as critically endangered under the EPBC Act due to declines in their global populations. Since the 1990's there has been a strong and sustained decline in curlew sandpiper numbers. A similar, but less marked decline can also be observed for eastern curlew numbers at the site. Both species are also listed under the Migratory Shorebird Conservation Action Plan (Birdlife Australia) which seeks to improve coordination and collaboration on conservation actions for the 37 species of migratory shorebirds which regularly visit Australia.

While there are historic records of orange-bellied parrot (*Neophema chrysogaster*) from the saltmarshes of the Site, the species is in serious decline and has not been recorded in the Site for over two decades (BirdLife Australia unpublished data). Similarly there is a single record of an Australian painted snipe (*Rostratula australis*) from Pyramid Rock in 1979, which is insufficient to indicate that the Site regularly supports this species. There are isolated records of the hooded plover (*Thinornis rubricollis rubricollis*) from beaches within the Site. However, habitat requirements and records for this species indicate that the open coast beaches on the southern shore of Phillip Island are important for hooded plover (Weston 2003, Maguire et al. 2014), which are outside the boundary of the Site.

☒ Criterion 3 : Biological diversity

Justification

Evidence indicates that the Site meets this criterion with respect to marine invertebrates. The relevant bioregion is the expansive Bass Strait IMCRA Bioregion. The soft sediments of Western Port support a high diversity of ghost shrimps, including *Pseudocalliax tooradin*, a state listed threatened species and *Michelea microphylla*, a local endemic species known only from Crib Point (Wilson et al. 2011). The intertidal and subtidal reefs at San Remo support a high diversity of one invertebrate group — opisthobranchs (sea-slugs and sea-hares). Crawfish Rock, although small, is considered especially diverse: 600 species have been documented at this site: 130 algae, 150 sponges, 50 hydroids, 180 bryozoans and 80 ascidians (Shapiro 1975). In addition, the rare hydroid *Ralpharia coccinea* found at Crawfish Rock, and may be endemic to Western Port (Edmunds et al. 2010). While Western Port undoubtedly provides habitat for a large number of shorebirds, abundance of shorebirds is low compared to other sites in the bioregion such as Port Phillip Bay (data provided by BirdLife Australia).

☒ Criterion 4 : Support during critical life cycle stage or in adverse conditions

Optional text box to provide further information

Over 35 waterbirds listed under international migratory agreements have been recorded within the Site. This number includes species that, in Australia, are residents (e.g. eastern great egret) and vagrant seabirds for which the Site does not provide significant habitat (e.g. Artic jaeger). There are 12 species of international migratory shorebirds that are regularly supported (two thirds of seasons) by the Site. These include:

- Bar tailed godwit
- Common greenshank
- Curlew sandpiper
- Eastern curlew
- Grey tailed tattler
- Lesser sand plover
- Pacific golden plover
- Red knot
- Red-necked stint
- Ruddy turnstone
- Sharp tailed sand piper
- Whimbrel

The Site provides both feeding and high tide roost sites for these species (Hansen et al. 2011). In addition over 20 species of wetland dependent bird species have been recorded breeding within the Site, with breeding of beach nesting birds on French Island and the north shore of Phillip Island identified as being particularly significant (Dann 2011).

☒ Criterion 5 : >20,000 waterbirds

Overall waterbird numbers	20800
Start year	2000
End year	2019
Source of data:	Bird Life Australia, Richard Lyon (pers comm.), Atlas of Living Australia

☒ Criterion 6 : >1% waterbird population

Optional text box to provide further information

Species for which Western Port regularly supports > 1% of the population, with mean maximum counts (2000 – 2019) from data provided by BirdLife Australia; Richard Loyn (unpublished data) and Atlas of Living Australia:

- Australian fairy tern (*Sternula nereis nereis*) – mean max count 22 (1.5% of population)
- Australian pied oystercatcher (*Haematopus longirostris*) - mean max count 353 (3.2% of population)
- Curlew sandpiper (*Calidris ferruginea*) – Critically endangered - mean max count 1497 (1.7% of population)
- Eastern curlew (*Numenius madagascariensis*) - mean max count 657 (1.9% of population)
- Pacific gull (*Larus pacificus*) - mean max count 240 (4.8% of population)
- Red-necked stint (*Calidris ruficollis*) - mean max count 7430 (1.6% of population)

☒ Criterion 8 : Fish spawning grounds, etc.

Justification

The seagrass and other habitats within the embayment act as important nursery habitat for a range of fish and crustacean species (MacDonald 1992, Jenkins et al. 2013). Western Port is a key breeding area for some species such as elephant fish (*Callorhinchus milii*), school shark (*Galeorhinus galeus*) and Australian anchovy (*Engraulis australis*), and a nursery area for other species such as King George whiting (*Sillaginodes punctatus*), yellow-eye mullet (*Aldrichetta forsteri*) and Australian salmon (Arripis spp) (Jenkins 2011).

The site also supports a number of fish species that migrate between fresh, estuarine and marine waters as part of their life cycles, including the Australian grayling, black bream (*Acanthopagrus butcheri*) and the short-finned eel (*Anguilla australis*). At the time of listing Western Port was an important commercial fishery and remains significant for recreational fishing.

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

<no data available>

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

Phylum	Scientific 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								
Others																	
CNIDARIA / HYDROZOA	<i>Ralpharia coccinea</i>	☐	☐	☐	☐	☒	☐	☐	☐					☐	☐		Rare species may be endemic to the Site
Fish, Mollusc and Crustacea																	
CHORDATA / ACTINOPTERYGII	<i>Acanthopagrus butcheri</i>	☐	☐	☐	☐	☐	☐	☐	☒				LC	☐	☐		Migrate between marine, estuarine and fresh waters
CHORDATA / ACTINOPTERYGII	<i>Aldrichetta forsteri</i>	☐	☐	☐	☐	☐	☐	☐	☒				LC	☐	☐		nursery habitat
CHORDATA / ACTINOPTERYGII	<i>Anguilla australis australis</i>	☐	☐	☐	☐	☐	☐	☐	☒					☐	☐		Migrate between marine, estuarine and fresh waters
CHORDATA / ACTINOPTERYGII	<i>Arripis truttacea</i>	☐	☐	☐	☐	☐	☐	☐	☒					☐	☐		nursery habitat
CHORDATA / HOLOCEPHALI	<i>Callorhinchus milii</i>	☐	☐	☐	☐	☐	☐	☐	☒				LC	☐	☐		Breeding
CHORDATA / ACTINOPTERYGII	<i>Engraulis australis</i>	☐	☐	☐	☐	☐	☐	☐	☒				LC	☐	☐		Breeding
CHORDATA / ELASMOBRANCHII	<i>Galeorhinus galeus</i>	☒	☐	☐	☐	☐	☐	☐	☒				CR	☐	☐	National (EPBC) - Conservation dependent	Breeding
ARTHROPODA / MALACOSTRACA	<i>Michelea microphylla</i>	☐	☐	☐	☐	☒	☐	☐	☐					☐	☐		rare species may be endemic to the Site
CHORDATA / ACTINOPTERYGII	<i>Prototroctes maraena</i>	☒	☐	☐	☐	☐	☐	☐	☒				VU	☐	☐	National (EPBC) - Vulnerable	Migrate between marine, estuarine and fresh waters
ARTHROPODA / MALACOSTRACA	<i>Pseudocalliax tooradin</i>	☐	☐	☐	☐	☒	☐	☐	☐					☐	☐	State listed (Flora and fauna guarantee) - endangered	Rare species may be endemic to the Site. This species is listed as threatened at the state level.
CHORDATA / ACTINOPTERYGII	<i>Sillaginodes punctatus</i>	☐	☐	☐	☐	☐	☐	☐	☒					☐	☐		Breeding - nursery area
Birds																	
CHORDATA / AVES	<i>Arenaria interpres</i>	☒	☒	☐	☐	☐	☐	☐	☐				NT	☐	☐	National (EPBC) – Vulnerable	Migratory: Australia non-breeding

Phylum	Scientific 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>Calidris acuminata</i>	☒	☒	☐	☐	☐	☐	☐	☐				VU	☐	☐	National (EPBC) – Vulnerable	Migratory: Australia non-breeding
CHORDATA/ AVES	<i>Calidris canutus</i>	☒	☒	☐	☐	☐	☒	☐	☐				NT	☐	☐	National (EPBC) - Vulnerable	Migratory: Australia non-breeding The site regularly supports 10,000+ migratory shorebirds. Note that shorebird counts not identify abundance down to the species level. Whilst this species is likely to contribute to the overall abundance, species-specific count data is currently a knowledge gap.
CHORDATA/ AVES	<i>Calidris ferruginea</i>	☒	☒	☒	☐	☐	☒	☐	☐	1497	2000-2019	1.7	VU	☐	☐	National (EPBC) - Critically endangered	Species roosts at site. This species regularly exceeds the 1% threshold based on the EAAFP CSR 1 population estimate for this species which is 90,000 individuals (2004-2016 data) for the E, SE Asia and Australia (Non-breeding) population. The site regularly supports 1.7% of the flyway population.
CHORDATA/ AVES	<i>Calidris ruficollis</i>	☐	☒	☒	☐	☐	☒	☐	☐	7430	2000-2019	1.55	NT	☐	☐		Migratory: Australia non-breeding This species regularly exceeds the 1% threshold based on the EAAFP CSR 1 population estimate for this species which is 475,000 individuals (2005-2016 data) for the NE Siberia (breeding) population. The site regularly supports 1.55% of the flyway population.
CHORDATA/ AVES	<i>Charadrius mongolus</i>	☒	☒	☐	☐	☐	☒	☐	☐				EN	☐	☐	National (EPBC) - Endangered	Migratory: Australia non-breeding The site regularly supports 10,000+ migratory shorebirds. Note that shorebird counts not identify abundance down to the species level. Whilst this species is likely to contribute to the overall abundance, species-specific count data is currently a knowledge gap.
CHORDATA/ AVES	<i>Charadrius ruficapillus</i>	☐	☒	☐	☐	☐	☐	☐	☐				LC	☐	☐		Australian species - Breeding
CHORDATA/ AVES	<i>Haematopus longirostris</i>	☐	☒	☒	☐	☐	☒	☐	☐	353	2000-2019	3.2	LC	☐	☐		This species regularly exceeds the 1% threshold based on the WPE5 population estimate for this species which is 11,000 individuals (1992-2011 data) for the Australia, S New Guinea, Aru Island population. The site regularly supports 3.2% of the flyway population.
CHORDATA/ AVES	<i>Larus pacificus</i>	☐	☐	☒	☐	☐	☒	☐	☐	240	2000-2019	4.8	LC	☐	☐	Victorian Flora and Fauna Guarantee Act- Near threatened	This species regularly exceeds the 1% threshold based on the WPE5 population estimate for this species which is 4,950 individuals (1999 data) for the Pacificus population. The site regularly supports 4.8% of the flyway population.
CHORDATA/ AVES	<i>Limosa lapponica baueri</i>	☒	☒	☐	☐	☐	☒	☐	☐					☐	☐	National (EPBC) - Endangered	Migratory: Australia non-breeding The site regularly supports 10,000+ migratory shorebirds. Note that shorebird counts not identify abundance down to the species level. Whilst this species is likely to contribute to the overall abundance, species-specific count data is currently a knowledge gap.
CHORDATA/ AVES	<i>Numenius madagascariensis</i>	☒	☒	☒	☐	☐	☒	☐	☐	657	2000-2019	1.9	EN	☐	☒	National (EPBC) - Critically endangered	This species regularly exceeds the 1% threshold based on the EAAFP CSR 1 population estimate for this species which is 35,000 individuals (2005-2016 data) for the C&E Asia (breeding) population. The site regularly supports 1.9% of the flyway population.
CHORDATA/ AVES	<i>Numenius phaeopus</i>	☐	☒	☐	☐	☐	☐	☐	☐				LC	☐	☐		Migratory: Australia non-breeding
CHORDATA/ AVES	<i>Pluvialis fulva</i>	☐	☒	☐	☐	☐	☐	☐	☐				LC	☐	☐		Migratory: Australia non-breeding

Phylum	Scientific 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>	☒	☒	☒	☐	☐	☒	☐	☐	22	2000-2019	1.5		☐	☐	National (EPBC) - Vulnerable	Breeds regularly within the Site. This species regularly exceeds the 1% threshold based on the Wetlands International (2012) population estimate for this species which is 1200-1980 individuals (2009 data) for the Nereis (non-breeding) population, with a 1% threshold of 15 individuals. Using the 1% threshold, the site regularly supports 1.5% of the flyway population.
CHORDATA/ AVES	<i>Tringa brevipes</i>	☐	☒	☐	☐	☐	☐	☐	☐				LC	☐	☐		Migratory: Australia non-breeding
CHORDATA/ AVES	<i>Tringa nebularia</i>	☒	☒	☐	☐	☐	☐	☐	☐				LC	☐	☐	National (EPBC) - Endangered	Migratory: Australia non-breeding

1) Percentage of the total biogeographic population at the site

Criterion 4: The Site regularly supports over 35 species of migratory shorebird listed under international migratory bird treaties (DELWP Flora and Fauna Database). This number includes species that, in Australia, are residents (e.g. eastern great egret) and vagrant seabirds for which the site does not provide significant habitat (e.g. Artic jaeger). There are 12 species of international migratory shorebirds that are regularly supported (in two thirds of seasons) by the Site (listed above). The Site provides both feeding and high tide roost sites for these species (Hansen et al. 2011). In addition over 20 species of wetland dependent bird species have been recorded breeding within the Site. In particular, the Site provides habitat for beach nesting birds such as the Australian fairy tern, Australian pied oystercatcher and red-capped plover on French Island and the north shore of Phillip Island (Dann 2011).

WPE5 is Waterbird Population Estimates, Fifth Edition (Wetlands International 2012)

EAAFP CSR 1 is Report on the Conservation Status of Migratory Waterbirds of the East Asian – Australasian Flyway. First Edition (Mundkur and Langendoen 2022).

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	☒	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.

Optional text box to provide further information

The most recent mapping of saltmarsh, using the definitions of Boon (2011) indicate that there are 1143 hectares of saltmarsh inside the Site boundary (noting that there is a large area of saltmarsh adjacent to the site, but outside the Site boundary).

Creeping Rush (*Juncus revolutus*), Marsh Saltbush (*Atriplex paludosa* subsp. *paludosa*), and Salt Lawrencia (*Lawrencia spicata*) are characteristic species of saltmarsh vegetation.

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

4.1 - Ecological character

Western Port consists of large shallow intertidal areas, dissected by deeper channels and includes a number of small islands. The Western Port Ramsar Site ECD (Kellogg Brown and Root 2010) identified components, processes and services (CPS) that are critical to the ecological character of the Ramsar site. A 2016 addendum to the ECD makes some updates to the ECD. The critical CPS are as follows:

- Wetland bathymetry (intertidal and subtidal mud and sand flats) - the Site is a deep water coastal inlet. It comprises extensive intertidal mudflats (27 000 hectares) with deeper intertidal channels and a zone of mangroves. At low tide, approximately 40 percent of the Ramsar site is exposed and this forms important feeding habitat for shorebirds, including migratory waders. Beaches and saltmarshes occur above the high tide mark. Insufficient data are available to assess variability and change in sediment type and distribution.
- Geomorphology and sedimentation - the Site is characterised by the high sediment loads from the catchment, which are deposited in the river mouths and intertidal areas within the Site. Resuspension of sediments by wind and wave action in the predominantly shallow embayment is also an important process. Estimates of sediment input loads following European settlement have therefore varied between approximately 40,000 and 100,000 tonnes/annum. Sediments types are coarse sand, medium sand, fine sand to silt and clay. Insufficient data are available to assess variability and change
- Seagrass - covers intertidal and subtidal areas of the Site, but has been highly variable over time. It was at very low levels near the time of listing (7,200 hectares in 1983-84); but has increased in the north and west of the Site, with most recent (2011) estimates of 15,000 hectares.
- Saltmarsh - the Site contains one of the largest expanses of saltmarsh in Victoria (1,143 hectares, mapped in 2011) within the Site boundary. Natural variability of saltmarsh extent is low and the recovery of saltmarsh from disturbance is known to be slow. It is considered that the mapping in Boon (2011 et al.) is a reasonable estimate of the extent of saltmarsh present at the time of listing in 1982 as there is no evidence of decline.
- Mangroves - comprise a single species *Avicennia marina* and represent some of the most southerly extents of the species globally. Mangroves covered 1,200 hectares in 1975 and 1,700 hectares in 2013.
- Fish - the Site supports a diversity and abundance of fish and supports an important recreational fishery. A total of 92 fish species have been reported within Western Port since 1975. These are grouped into six fish assemblages associated with the various habitats in the Site. Most are small species such as gobies (Gobiidae), pipefish and weedfish (Clinidae). The seagrass and other habitats within the embayment act as important nursery habitat for a range of fish and crustacean species (MacDonald 1992, Jenkins et al. 2013). Western Port is a key breeding area for some species and a nursery area for other species.
- Waterbirds - a total of 115 waterbird species have been recorded within the Site, including over 35 species listed under international migratory bird agreements JAMBA, CAMBA and ROKAMBA. The Site provides significant foraging area for a variety of shorebird species as well as important roosting (resting) sites. The Site supports breeding waterbird species and is particularly important for beach nesting birds. There has been a decline in mean counts of ducks, fishers, grebes, large wading birds likely due to drought conditions.
- Threatened species - the Site supports ten nationally threatened species (see Section 3.3) listed under the EPBC Act, including the critically endangered eastern curlew, curlew sandpiper and the vulnerable fairy tern. The vulnerable Australian grayling migrates from rivers into the site for part of its lifecycle

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)		2	15000	Representative
G: Intertidal mud, sand or salt flats		1	27000	Representative
H: Intertidal marshes		4	1144	Representative
I: Intertidal forested wetlands		3	1700	Representative

Other non-wetland habitat

Other non-wetland habitats within the site	Area (ha) if known
Terrestrial coastal native vegetation and cleared land	14450

(ECD) Habitat connectivity

Connectivity between the catchment and the marine areas of Western Port is important for migratory fish such as the vulnerable Australian grayling as it migrates from rivers into the site for part of its lifecycle.

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Phylum	Scientific name	Position in range / endemism / other
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Avicennia marina australasica</i>	Most extensive and well developed mangrove community in Victoria
TRACHEOPHYTA/LILIOPSIDA	<i>Puccinellia stricta</i>	Species of critical importance to maintaining the saltmarsh and mangrove vegetation communities within the site.
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Tecticornia arbuscula</i>	Species of critical importance to maintaining the saltmarsh and mangrove vegetation communities within the site.
TRACHEOPHYTA/LILIOPSIDA	<i>Zostera capricorni</i>	Main source of primary production within the ecosystem
TRACHEOPHYTA/LILIOPSIDA	<i>Zostera tasmanica</i>	Rare in Victoria

Invasive alien plant species

Phylum	Scientific name	Impacts	Changes at RIS update
TRACHEOPHYTA/LILIOPSIDA	<i>Juncus acutus</i>	Actual (major impacts)	No change
TRACHEOPHYTA/LILIOPSIDA	<i>Spartina anglica</i>	Actual (major impacts)	No change
TRACHEOPHYTA/LILIOPSIDA	<i>Thinopyrum elongatum</i>	Potential	No change

Optional text box to provide further information

Terrestrial pest species pose a threat to many values of the Ramsar Site. Terrestrial plant species currently threaten the intertidal and estuarine areas of the Site and in turn the habitat these areas provide. Exotic flora species are known to outcompete and displace native species, while also providing refuge for exotic fauna species. In 2003, the Victorian Department of Sustainability and Environment reported that a total of 93 non-indigenous plant species had been recorded within the Site; however a detailed species list was not provided.

A program to maintain or improve the values of the Site was funded by the Australian Government from 2013 – 2018 (RMCG, 2018). Under this program, 1,433 hectares of coastal saltmarsh and mangrove vegetation were treated for pest plants identified as habitat altering weeds that degrade the quality of saltmarsh vegetation. Monitoring showed an average improvement in groundstorey vegetation cover of 32 percent across the sample sites from the beginning to the end of the program. This work is continuing under a new project titled “Two Great Ramsar Wetlands”, which commenced in 2018.

4.3.2 - Animal species

Invasive alien animal species

Phylum	Scientific name	Impacts	Changes at RIS update
CHORDATA/ASCIDIACEA	<i>Ascidella aspersa</i>	Potential	No change
BRYOZOA/GYMNOLAEMATA	<i>Bugula neritina</i>	- Please select a value -	No change
CHORDATA/ASCIDIACEA	<i>Ciona intestinalis</i>	Potential	No change
CHORDATA/MAMMALIA	<i>Felis catus</i>	- Please select a value -	No change
CHORDATA/MAMMALIA	<i>Oryctolagus cuniculus</i>	Actual (minor impacts)	No change
CHORDATA/MAMMALIA	<i>Rattus rattus</i>	Actual (minor impacts)	No change
CHORDATA/ASCIDIACEA	<i>Styela clava</i>	Potential	No change
CHORDATA/ASCIDIACEA	<i>Styela plicata</i>	- Please select a value -	No change
CHORDATA/MAMMALIA	<i>Sus scrofa</i>	Actual (major impacts)	No change
CHORDATA/MAMMALIA	<i>Vulpes vulpes</i>	Actual (major impacts)	No change
BRYOZOA/GYMNOLAEMATA	<i>Watersipora subtorquata</i>	- Please select a value -	No change
ARTHROPODA/MALACOSTRACA	<i>Carcinus maenus</i>	Potential	No change
MOLLUSCA/BIVALVIA	<i>Theora lubrica</i>	Potential	No change

Optional text box to provide further information

The intertidal and subtidal reefs at San Remo, which support a high diversity of one invertebrate group — opisthobranchs (sea-slugs and sea-hares) and Crawfish Rock, although small, is considered especially diverse: 600 species have been documented at this site: 130 algae, 150 sponges, 50 hydroids, 180 bryozoans and 80 ascidians (Shapiro 1975). In addition, the rare hydroid *Ralpharia coccinea* found at Crawfish Rock, and may be endemic to Western Port (Edmunds et al. 2010).

A program to maintain or improve the values of the Western Port Ramsar site was funded by the Australian Government from 2013 – 2018 (RMCG, 2018). Under this program, 83,000 hectares of pest animal control targeting key shorebird predators and grazing pests (foxes, cats, black rats), was carried out. Monitoring showed an overall reduction in the catch per unit effort for cats, feral cats, pigs and foxes. Shorebird data for the same period showed a stable trend in bird numbers, making it unclear whether the pest animal control efforts were adequate. This work is continuing under a new project titled “Two Great Ramsar Wetlands”, which commenced in 2018.

This new project has carried out baseline vegetation assessments on priority saltmarsh vegetation communities that have shown increased disturbance and degradation as a direct result of feral pig wallowing. Additional monitoring is planned following pig control activities.

The French Island Feral Cat Control program commenced in 2018 builds on previous activities. Baseline activity of feral cats and native wildlife populations, particularly ground-nesting birds has been established. Analysis of remote camera footage suggests that French Island currently supports a population of approximately 97 feral cats, at a density of 0.55 feral cats per square kilometre. In 2019 29 feral cats trapped over an eight-week period, Ground-nesting birds, are also monitored via camera surveys, enviro-acoustic surveys and driving transect surveys. This data will be used as an indicator of environmental change following intensive feral cat management and will help to assess and evaluate the efficacy of feral cat management. More than one-thousand feral cats have been culled as part of an island wide cage-trapping program since 2009.

The feral pig control program plans to remove all feral pigs from Quail Island by 2021. A monitoring program is in place that includes use of remote cameras and aerial monitoring using drones fitted with thermal imaging cameras

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
C: Moist Mid-Latitude climate with mild winters	Csb: Mediterranean (Mild with dry, warm summer)

While there have been no notifiable changes to ecological character, the site is subject to a changing climate. Australia has warmed by just over 1 °C since 1910, with most warming since 1950.

According to the BOM Regional Weather and Climate Guide 2019 for Port Phillip and Western Port the region has, over the last 30 years, seen changes to the climate and weather including:

- Annual rainfall has decreased slightly with specific decreases in autumn and spring
- Rainfall is moderately reliable year round
- Dry years (lowest 30% rainfall) have occurred 12 times and wet years (highest 30% rainfall) seven times
- There have been more hot days, with more consecutive days above 35 °C.
- There have been fewer frosts

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.

An embayment connected to the Southern Ocean. Seventeen rivers discharge into the Ramsar site including: Bass, Bunyip and Lang Lang Rivers, and Cardinia Creek.

4.4.3 - Soil

Mineral ☒

(Update) Changes at RIS update ☒ No change ☐ Increase ☐ Decrease ☐ Unknown ☐

No available information ☐

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

4.4.4 - Water regime

Water permanence

Presence?	Changes at RIS update
Usually permanent water present	

Source of water that maintains character of the site

Presence?	Predominant water source	Changes at RIS update
Marine water	☒	No change
Water inputs from surface water	☐	unknown

Water destination

Presence?	Changes at RIS update
Marine	No change

Stability of water regime

Presence?	Changes at RIS update
Water levels fluctuating (including tidal)	No change

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

Tides occur twice daily within Western Port with the Site experiencing a relatively large tidal range for Victorian embayments of between 2.3 and 3.1 metres. The tidal regime in Western Port is characterised by an unequal, semidiurnal pattern, meaning that the flooding and ebbing both have a higher and lower event every day (Parks Victoria 2007). The tidal flux is significantly greater than the freshwater inflows received by Western Port (1,100 ML/d of freshwater from the 17 waterways that flow into the bay) and the volume of water exchanged in each tidal cycle is roughly equivalent to the volume of the Bay.

The tidal regime of Western Port is considered an essential element of the sites critical components such as bathymetry, sediment transport and deposition, and habitat. Tidal influences are also the driving process behind providing feeding habitats for waterbirds in the Site by exposing intertidal mudflats and seagrass vegetation and contributing to the assemblages of marine invertebrates and fish present within each habitat. Loyn et al. (2001) describe the main feeding habitats used by waders in the site, which include: the mudflats and shallows of the tidal areas; seagrass; saltmarsh; and fresh water margins. Similarly, the energy created by tidal movements is responsible for moving sediments (sediment input, resuspension and deposition) which plays an important role in creating suitable habitats for vegetation growth such as seagrass which in turn contributes to habitat for waterbirds, fish species and marine invertebrates. Water movement associated with tidal flows, or waves generated by localised winds, also significantly affects sediment transport and water quality by resuspending fine sediments. Global warming and resultant sea level changes could impact on the frequency of inundation and area exposed that provides habitat for waterbirds.

(ECD) Connectivity of surface waters and of groundwater

The sea grass beds in Western Port are potential groundwater-dependent ecosystems but the flow of groundwater into and under Western Port is poorly understood (Southern Rural Water 2014).

(ECD) Stratification and mixing regime

The high tidal volume results in a well mixed, generally unstratified water column.

4.4.5 - Sediment regime

Significant erosion of sediments occurs on the site ☒

(Update) Changes at RIS update No change ☒ Increase ☐ Decrease ☐ Unknown ☐

Significant accretion or deposition of sediments occurs on the site ☒

(Update) Changes at RIS update No change ☒ Increase ☐ Decrease ☐ Unknown ☐

Significant transportation of sediments occurs on or through the site ☒

(Update) Changes at RIS update No change ☒ Increase ☐ Decrease ☐ Unknown ☐

Sediment regime is highly variable, either seasonally or inter-annually ☒

(Update) Changes at RIS update No change ☒ Increase ☐ Decrease ☐ Unknown ☐

Sediment regime unknown ☐

Please provide further information on sediment (optional):

There are a number of sources of sediments to Western Port, including catchment derived sediments (approximately 70% of total discharge) and erosion of clay banks, particularly around the Lang Lang area (Tomkins et al. 2014). The vast majority of catchment derived sediment loads come from rural lands (85%); with agriculture (cropping and dairy) accounting for the largest loads (Melbourne Water 2009). The dominant catchment source for fine sediment is channel and gully erosion of Lang Lang River and, to a lesser extent, Bunyip River.

There are no clear trends in the concentration of suspended solids in Western Port, which have remained stable since monitoring commenced in 1984 (EPA Victoria 2011b, Holland et al. 2013). As with nutrients (described above) the run-off of sediments under future climate predictions may be lower during periods of drought, but very high during storm and flood events.

(ECD) Water turbidity and colour

Western Port is characterised by highly turbid waters which has increased in response to erosion (coastal and catchment)

(ECD) Light - reaching wetland

Turbidity key threat to sea grass in Western Port due to reduced light penetration which affects photosynthesis

(ECD) Water temperature

No information available

4.4.6 - Water pH

Alkaline (pH>7.4) ☒

(Update) Changes at RIS update No change ☒ Increase ☐ Decrease ☐ Unknown ☐

Unknown ☐

4.4.7 - Water salinity

Euhaline/Eusaline (30-40 g/l) ☒

(Update) Changes at RIS update No change ☐ Increase ☒ Decrease ☐ Unknown ☐

Unknown ☐

Please provide further information on salinity (optional):

Salinity and dissolved oxygen are considered critical water quality parameters as a result of their influence on suitable habitat for seagrass and mangrove vegetation (Rogers 2005) as well as their importance in maintaining faunal values. Salinity in the site is influenced largely by rainfall and during extended periods of low rainfall can increase, which was observed during the Millennium Drought (2000 – 2010). Increased rainfall in 2011 and 2012 and again in 2016 and 2019, have resulted in improved salinity at the site.

(ECD) Dissolved gases in water

Dissolved oxygen (DO) is important to maintaining the ecological character of the wetland. DO levels fluctuate in response to rainfall in the catchments.

4.4.8 - Dissolved or suspended nutrients in water

Unknown ☒

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

Seagrass vegetation absorbs nutrients required for growth such as phosphate from the water column and sediments while giving off organic carbon, phosphate and silicate (particularly in summer) (Longmore 1997). Historical seagrass loss in Western Port has been reported to be accompanied by significant water quality changes (Longmore 1997; Shepherd 2009). Increased levels of turbidity and elevated levels of nutrients are of particular concern for seagrass growth and survival (Longmore 1997). Water quality data indicates a decline in nutrients during the drought years, most likely as a result of the decline in rainfall and catchment inputs (Melbourne Water 2011). Analyses indicate no long-term trend or baseline shift in nutrients in Western Port (EPA Victoria 2011) and the most recent report card for the site suggests that nutrients levels are indicative of “very good” condition (<https://yarraandbay.vic.gov.au/report-card/report-card-2018/western-port-and-catchment/western-port-#history>).

(ECD) Dissolved organic carbon	See above
(ECD) Redox potential of water and sediments	No information available
(ECD) Water conductivity	No information

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 site itself:
i) broadly similar ☐ ii) significantly different ☒

- 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 Site boundary follows the shoreline (at times dissecting the saltmarsh community) and including some terrestrial land adjacent to the shore, primarily in public reserves. The site is almost wholly marine and used primarily for conservation and recreation. By contrast the catchment has areas of urban development (that are increasing over time) but is largely used for agricultural activities.

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)	Low

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Erosion protection	Soil, sediment and nutrient retention	Medium
Hazard reduction	Coastal shoreline and river bank stabilization and storm protection	Medium

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Recreational hunting and fishing	High
Recreation and tourism	Picnics, outings, touring	High
Spiritual and inspirational	Cultural heritage (historical and archaeological)	Medium
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	Medium
Scientific and educational	Major scientific study site	High

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

Within the site: 1000's

Outside the site: 10,000's

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

Where economic studies or assessments of economic valuation have been undertaken at the site, it would be helpful to provide information on where the results of such studies may be located (e.g. website links, citation of published literature):

The Port of Hastings contributes around \$67 million annually to the region's economy and tourist expenditure for Western Port (excluding Phillip Island) is valued at \$285 million per year (Worley Parsons 2013). Based on figures presented in Carnell (2015) and the total area of saltmarsh and seagrass within the Site, the blue carbon value of the Western Port Ramsar Site is in the order of \$11.5 million.

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	Primary productivity comes mainly from seagrass beds on the mudflats, and mangroves in the peripheral vegetation
(ECD) Nutrient cycling	The mangrove, saltmarsh and sea grass vegetation of the Ramsar site plays an important role in cycling nutrients in the bay
(ECD) Carbon cycling	Saltmarsh, seagrass and mangroves (blue carbon ecosystems) are significant carbon sinks. The the blue carbon value of the Western Port Ramsar Site is estimated to be in the order of \$11.5 million (Carnell, 2015)
(ECD) Animal reproductive productivity	the Site provides breeding habitat for 45 waterbird species (two seabirds, eight waders and 35 other waterbird species). It is therefore a significant site on a state, regional, national and international level for maintaining waterbird diversity.
(ECD) Vegetational productivity, pollination, regeneration processes, succession, role of fire, etc.	no information available
(ECD) Notable species interactions, including grazing, predation, competition, diseases and pathogens	no information available
(ECD) Notable aspects concerning animal and plant dispersal	no information available
(ECD) Notable aspects concerning migration	Diadromous Australian Greying migrate to lower rivers to spawn where egg/larve drift out into Western Port and spend juvenile life stage in saltwater. Little known about migration back to freshwater.
(ECD) Pressures and trends concerning any of the above, and/or concerning ecosystem integrity	Erosion and suspension of fine sediments is identified as a key threat to sea grass condition and extent - smothers plants and limits sunlight penetration

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
National/Federal government	☒	☐
Provincial/region/state government	☒	☐
Local authority, municipality, (sub)district, etc.	☒	☐

Private ownership

Category	Within the Ramsar Site	In the surrounding area
Other types of private/individual owner(s)	☒	☒

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

There are a variety of tenures associated with the lands and waters of the Western Port Ramsar Site. The majority of the Site is public land and waters reserved as marine and terrestrial national parks, nature conservation reserves, nature parks, coastal reserves, public purposes reserves or unreserved Crown Land. These reserves are reserved and managed under various Victorian acts including the National Parks Act 1975, the Crown Land (Reserves) Act 1978, The Wildlife Act 1975, the Land Act 1958, the Marine Act 1988 and the Port Management Act 1995. A small area of water is declared naval waters and managed under the Commonwealth Control of Naval Waters Act 1918. The remaining area is freehold.

5.1.2 - Management authority

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

Parks Victoria
Melbourne Water
Department of Environment, Land, Water and Planning
Port Phillip and Westernport Catchment Management Authority

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

Andrew Morrison, Western Port Ramsar Site Coordinator; Environmental Projects Coordinator, Port Phillip & Westernport Catchment Management Authority

Postal address:

Level 1, 454-472 Nepean Hwy, Frankston, VIC, 3199

E-mail address:

andrew.morrison@ppwcma.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	Changes	In the surrounding area	Changes
Housing and urban areas	Low impact	High impact	☐	No change	☒	increase

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Livestock farming and ranching	Low impact	Medium impact	☐	No change	☒	No change

Energy production and mining

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Unspecified	Medium impact	High impact	☒	unknown	☐	unknown

Biological resource use

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Fishing and harvesting aquatic resources	unknown impact	unknown impact	☒	decrease	☐	No change

Human intrusions and disturbance

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Recreational and tourism activities	Medium impact	High impact	☒	increase	☐	No change

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Vegetation clearance/ land conversion	Low impact	High impact	☒	increase	☒	increase

Invasive and other problematic species and genes

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Invasive non-native/ alien species	Medium impact	High impact	☒	No change	☐	No change

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Household sewage, urban waste water	Low impact	Medium impact	☒	No change	☒	increase
Agricultural and forestry effluents	Medium impact	High impact	☒	unknown	☒	unknown

Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Habitat shifting and alteration	Low impact	Medium impact	☒	increase	☐	No change
Storms and flooding	Low impact	High impact	☒	unknown	☒	unknown

Please describe any other threats (optional):

Invasive non-native/ alien species: please refer to sections 4.3.1 and 4.3.2
Climate change and severe weather: please refer to section 2.1.5
The recent 2017 renewal of the Western Port Ramsar site management plan identified the following high priority threats for management:

1. Invasive species: Cord-grass (*Spartina* spp.)
2. Invasive species: new and emerging salt-tolerant weeds
3. Invasive species: foxes and cats preying on shorebirds and beach nesting birds
4. Invasive species: introduced marine pests (current and potential new invasions)
5. Invasive species: pigs, goats, rabbits in intertidal areas
6. Climate change: sea level rise
7. Climate change: increased frequency and intensity of storms leading to shoreline erosion
8. Climate change: increased frequency and intensity of storms leading to increased sediments
9. Recreation: Vehicles in the intertidal zone
10. Recreation: Disturbance of shorebirds and beach nesting birds
11. Recreational fishing (including bait pumping)
12. Nutrients from rural and agricultural areas
13. Sediments from rural and agricultural areas
14. Toxicants from rural and agricultural areas
15. Nutrients from urban areas
16. Toxicants from urban areas
17. Urban, commercial and industrial development (direct habitat removal and associated impacts)

In addition to the threats identified through the risk assessment process, the Steering Committee and Stakeholder Advisory Group considered that there were a number of non-physical threats that were critical to the management of the Site. These included:

- A lack of awareness of the values and Ramsar status of Western Port, by broad sections of the community.
- Poor integration of agency and NGO efforts.
- Inadequate and variable resourcing for management actions to maintain the ecological character of the Site.

Western Port is located east of Melbourne, in a catchment that comprises a portion of the greater Melbourne Area (City of Casey, Shire of Mornington Peninsula) and regional areas (Shire of Cardinia, Bass Coast Shire). The population in greater Melbourne is predicted to double to over 8 million by 2050 (Department of Transport, Planning and Local Infrastructure 2016). This increase in population in the catchment is predicted to have an effect on increasing recreational use of the Site, landuse clearing in the catchment and potential for an increase in nutrients and other pollutants in urban run-off (Hale and Boon 2017). While the increase in population may add increased recreational fishing pressure on the Site, commercial fishing net fishing was phased out in Western Port on 2009, reducing the overall fishing threat.

5.2.2 - Legal conservation status

Global legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
UNESCO Biosphere Reserve	Mornington Peninsula and Western Port Biosphere Reserve	https://www.biosphere.org.au/	whole

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Marine National Parks	Yaringa, French Island and Churchill Islands Marine National Parks	https://parkweb.vic.gov.au/exploring/parks/french-island-marine-national-park	whole

Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	Western Port	http://www.birddata.com.au/iba.vm	whole

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	Implemented
Habitat manipulation/enhancement	Implemented
Re-vegetation	Implemented
Land conversion controls	Implemented

Species

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

Human Activities

Measures	Status
Regulation/management of wastes	Implemented
Communication, education, and participation and awareness activities	Partially implemented
Regulation/management of recreational activities	Partially implemented
Harvest controls/poaching enforcement	Partially implemented
Research	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). This means that developments which have or are likely to have a significant impact on the ecological character of the Site must be referred for assessment and approval by from the Australian Government Minister for the Environment.

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):

<http://www.delwp.vic.gov.au/water/rivers,-estuaries-and-wetlands/western-port-ramsar-site-management-plan>

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 quality	Implemented
Plant community	Implemented
Birds	Implemented

A Monitoring Evaluation Reporting and Improvement (MERI) Plan for the Western Port Ramsar Site was drafted in 2018. As a living document, it is regularly updated. The Plan identifies the monitoring requirements to track the status of ecological character as well as the effectiveness of management actions implemented at the site. Current monitoring activities include:

- Monitoring of bryozoan reefs for invertebrate diversity, fish diversity and biomass, reef type and extent and recreational fisher impacts
- Waterbird diversity and abundance
- Waterbird breeding of beach nesting birds
- Water quality in catchment inflows and the Bay itself
- Seagrass, mangrove and saltmarsh extent and condition
- Cat and fox populations at key roosting sites.

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

Full bibliography attached as a separate document in section 6.1.2 vi

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

<4 file(s) uploaded>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:



Western Port Ramsar Site,
mangrove community , Blind
Bight (Janet Holmes,
Department of Environment,
Land, Water and Planning,
20-10-2015)



Western Port Ramsar Site,
saltmarsh community ,
Tooradin (Janet Holmes,
Department of Environment,
Land, Water and Planning,
10-11-2014)



Western Port Ramsar Site,
saltmarsh community ,
Bittern (Janet Holmes,
Department of Environment,
Land, Water and Planning,
10-11-2014)

6.1.4 - Designation letter and related data

Designation letter

<1 file(s) uploaded>

Date of Designation 1982-12-15