Ramsar Information Sheet

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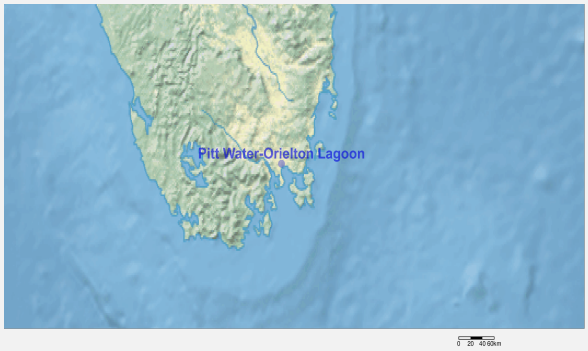
Australia

Pitt Water-Orielton Lagoon



Designation date	16 November 1982
Site number	254
Coordinates	42°47'56"S 147°30'38"E
Area	3 334,00 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 Pitt Water-Orielton Lagoon is located on the southeast coast of Tasmania. It comprises the uppermost parts of a wave-dominated barred estuary with typical shallow open central basin, extensive intertidal flats and fringing saltmarshes and sandy shorelines. The Site includes estuaries of four watercourses: Coal River, Sorell Rivulet, Orielton Rivulet and Iron Creek.

Pitt Water-Orielton Lagoon currently meets criteria 2, 3, 4, 8 and 9:

2: The Site supports nationally and internationally listed threatened species and a threatened ecological community.

3: The Site hosts fringing saltmarshes and is important for maintaining fish and bird biodiversity.
Birdlife includes migratory and resident waterbirds. Rocky and sandy shorelines and islands provide roosting and nesting sites. Estuarine waters are a rich food source. The extensive intertidal flats provide feeding areas, and the saltmarshes provide roosting and foraging areas. Estuarine and marine fish species inhabit the site continuously or seasonally. Diverse habitats include sandy shoals and bays, seagrass beds and open water.

4: The Site provides important habitat for non-breeding migratory shorebirds, including 30 species listed under international migratory bird agreements. Orielton Lagoon is one of only two sites in Tasmania included in the East Asian-Australasian Flyway Network. The Site is the southern-most area in Australia where relatively high numbers of migratory shorebirds occur. Pitt Water has a diversity of estuarine and marine fish species.

8: Within the bioregion, the Site is the most important breeding ground for several species of commercially harvested sharks, with the most significant numbers of juvenile school sharks found in Pitt Water. It is a declared Shark Refuge Area under the Tasmanian Living Marine Resources Management Act.

9: The Site is the stronghold for the endemic sea star Parvulastra vivipara, hosting the greatest numbers from across 13 sites. It is estimated that 92% of the population occurs in the Pitt Water area, of which around half (45%) are within the Site's boundary.

The Site may also meet criterion 6 for the pied oystercatcher (Haematopus longirostris). This will be reassessed when additional information is available.

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 Agriculture, Water and the Environment
Postal address	GPO Box 858 Canberra ACT 2601 Australia

National Ramsar Administrative Authority

Institution/agency	Department of Agriculture, Water and the Environment
Postal address	GPO Box 858 Canberra ACT 2601 Australia

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

From year	2014
To year	2022

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Pitt Water-Orielton Lagoon

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) 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

(Update) Optional text box to provide further information

The extent of change is unknown, but the trend is generally positive.

There have been notable changes since listing (in 1982). Construction Craigbourne Dam on the Coal River in 1985 resulted in lower overall flows in the Coal River, with a reversal of peak seasons from winter to summer and ceasing of flushing flows (Fuller 1996, Gallagher 1998). Before being dammed, the Coal River often ceased to flow during the summer months (Gallagher 1998). The outlet of Craigbourne Dam does not have flood control gates or other means of simulating flood conditions downstream when they occur upstream.

The extent of seagrass beds in the estuary appears to have declined considerably and fish populations are reported to have declined. The extent of saltmarshes has declined, and floristics of some saltmarshes has altered.

The construction of causeways has limited tidal exchange, notably in Orielton Lagoon, although the addition of culverts and drains has improved tidal exchange in the lagoon. Changes in sediment transport within the site have resulted from factors outside the Site, as well as possible sea level rise due to climate change.

The Site has also been subject to a changing climate. Australia has warmed by an average of 1.4°C (higher than the global average) since national records began in 1910, leading to an increased frequency of extreme heat events. Further increases in temperature are projected, with most extremely hot days and fewer extremely cool days under all emissions scenarios (BoM and CSIRO 2020). These conditions will affect the critical components, processes, and services of the Site and will test the site's resilience. Climate projections and the information available to guide wetland management is continually evolving. This RIS will be updated as more information becomes available on this issue.

2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image

<1 file(s) uploaded>

Former maps	0

Boundaries description

The boundary of the Pitt Water-Orielton Lagoon runs from a point just south of the first causeway at Pitt Water Bluff, around upper Pitt Water estuary and Orielton Lagoon, Sorell Rivulet estuary and Iron Creek estuary to Shellfish Point and then directly across lower Pitt Water (from Pitt Water Bluff to the mouth of Iron Creek) back to the origin.

The boundary for the most part follows high water mark and property boundaries. The boundary includes all of allotment 1 on Central Plan Register (CPR) 5776 from the Tasmanian Information and Land Services, Department of Primary Industries, Water and Environment. CPR 5776 horizontal datum is Australian Geodetic Datum (AGD66) Universal Transverse Mercator Projection Australian Map Grid (UTM AMG66) and Australian Height Datum (Tasmania) for vertical datum.

Geographical coordinates for the approximate centre of the site are: 42° 47' 56.53"S, 147° 30' 37.95"E.

Cadastral information about surrounding land parcels can be obtained from the Land Information System Tasmania (LIST) mapping site http://maps.thelist.tas.gov.au/listmap/app/list/map.

In 2001, the boundary of the Pitt Water-Orielton Lagoon Site was mapped more accurately using an updated coverage of the high-water mark. The area was recalculated to 3,334 ha. The boundary of the Site remains the same. The whole site is less than 20 m ASL.

2.2.2 - General location

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

The Pitt Water-Orielton Lagoon Ramsar site lies within the Sorrell and Clarence Municipalities of Tasmania, Australia.

b) What is the nearest town or population centre?

The wetland is between the towns of Cambridge (population 1,160), Richmond (population 880), Midway Point (population 2,900), Sorell (population 2,500) and Lewisham (population 700). It is approximately 20 km east of Hobart (population 206,100)

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): 3334

Area, in hectares (ha) as calculated from GIS boundaries: 3334.481

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Other scheme (provide name below)	Tasmania drainage division, Coal River region
Other scheme (provide name below)	Cold Temperate Waters – Tasmanian IMCRA Province
Other scheme (provide name below)	Tasmanian South East; Tasmanian Shelf province; Bruny marine bioregion.

Other biogeographic regionalisation scheme

Bureau of Meteorology (2012). Australian Hydrological Geospatial Fabric (Geofabric): Topographic Drainage Divisions and River Regions: Tasmania – Coal River. (http://www.bom.gov.au/water/geofabric/documents/BOM002_Map_Poster_A3_Web.pdf)

Commonwealth of Australia (2006). Integrated Marine and Coastal Regionalisation of Australia (IMCRA) Version 4: Cold Temperate Waters – Tasmanian IMCRA Province (https://parksaustralia.gov.au/marine/management/resources/scientific-publications/guide-integrated- marine-and-coastal-regionalisation-australia-version-40-june-2006-imcra/).

Commonwealth of Australia (2012). Interim Biogeographic Regionalisation for Australia, Version 7: Tasmanian South East – TSE01, South East. Provincial Bioregion: Tasmanian Shelf Province; Mesoscale Bioregion: Bruny Marine Bioregion (https://www.environment.gov.au/land/nrs/science/ibra/australias-bioregions-maps).

3 - Why is the Site important?

3.1 - Ramsar Criteria and their justification

<no data available>

☑ Criterion 2 : Rare species and threatened ecological communities

Optional text box to provide further information

The Site provides habitat for 4 species and 1 ecological community that are listed as threatened nationally under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and/ or internationally under the IUCN Red List:
• Tasmanian live-bearing seastar (Parvulastra vivipara) (EPBC – vulnerable)
• eastern curlew (Numenius madagascariensis) (EPBC – critically endangered)
• Australian fairy tern (Sternula nereis nereis) (EPBC – nationally endangered, IUCN – vulnerable).
• school shark (Galeorhinus galeus) (EPBC – conservation dependent, IUCN – critically endandered)
• Subtropical and Temperate Coastal Saltmarsh ecological community (EPBC – vulnerable).

The Tasmanian live-bearing seastar is a tiny, uniformly orange yellow seastar, up to 15 mm across. It occurs in the sheltered waters of south-east Tasmania. The largest subpopulation is in the Site (DoE 2022).

The eastern curlew is Australia's largest shorebird. It migrates annually to Russia and north-eastern China to breed, returning to Australia in August to feed on crabs and molluscs in intertidal mudflats. It is extremely shy and will take flight at the first sign of danger (DoE 2022a).

The Australian fairy tern is small piscivorous (fish-eating) bird. It occurs along the coasts of Victoria, Tasmania, South Australia, and Western Australia. It has been recorded within the Site but is not known to breed there.

The school shark is a moderately slender, bronze-grey shark with a very large sub-terminal lobe on the caudal fin (giving it a double-tailed appearance). Females and juveniles utilise inshore coastal areas, including within the Ramsar site for nursery areas (DoE 2022c).

Subtropical and Temperate Coastal Saltmarsh consists mainly of salt-tolerant vegetation (halophytes) including grasses, herbs, sedges, rushes, and shrubs. Succulent herbs, shrubs and grasses generally dominate, and vegetation is generally of less than 0.5 m height (except for some reeds and sedges) (DoE 2022d). The Site contains one of the most significant areas of samphire (saltmarsh) in Tasmania which provides roosting and foraging areas for shorebirds and seabirds.

☑ Criterion 3 : Biological diversity

Justification

Pitt Water-Orielton Lagoon supports important biodiversity values, including a diversity of intertidal and subtidal habitats; fish communities; and saltmarshes. Several plant and invertebrate species that occur at the site are considered rare in Tasmania.

Extensive areas of saltmarsh are within and adjacent to the Site and are integral to the ecological character of the entire estuary. The following State-listed rare species (Tasmanian Threatened Species Protection Act 1995 (TSP Act)), occur within the Site:
• land plants: lemon beauty heads (Calocephalus citreus) and silky wilsonia (Wilsonia humilis)
• intertidal plants: Tasmanian sea lavender (Limonium australe var. baudinii), slender watermat (Lepilaena preissii), and fennel pondweed (Stuckenia pectinata)
• invertebrates: chequered blue butterfly (Theclinesthes serpentata lavara).

The principal seagrass species occurring in the Site is Zostera muelleri, which colonises the intertidal flats and shallower bays. Ruppia sp is a perennial aquatic grass which may be found in areas with more freshwater influence, such as the head of the estuary and Orielton Lagoon. The Site supports the Subtropical and Temperate Coastal Salt Marsh ecological community, listed as vulnerable under the EPBC Act.

Pitt Water-Orielton Lagoon is important for the conservation of coastal birdlife of the Tasmanian South-East Bioregion (IBRA) and Bruny Marine Bioregion (IMCRA). Birdlife at the Site includes migratory and resident waterbirds (shorebirds and seabirds). These use a wide array of habitats including rocky and sandy shorelines and islands (roosting and nesting sites), estuarine waters (rich food source), extensive intertidal flats (feeding areas for migratory and resident shorebirds and seabirds), and saltmarshes (roosting and foraging areas). Orielton Lagoon is a Flyway Site under the East Asian-Australasian Flyway Network and is the most southerly site for shorebird migration. The two most important subsites within the Site are Orielton Lagoon and Barilla Bay.

Estuarine and marine fish species inhabit the Site, some continuously, others on a seasonal basis. Diverse habitats including sandy shoals and bays, seagrass beds and open water are used by different fish species. An endemic viviparous (live bearing) starfish (Parvulastra vivipara) (listed as vulnerable under the TSP Act and EPBC Act) has its stronghold in the Site, and only occurs within the Bruny Bioregion.

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

Optional text box to provide further information

Pitt Water-Orielton Lagoon regularly attracts at least seven species of migratory shorebirds that use the site as a feeding ground during the (northern) winter (Birds Tasmania unpublished data 2009). Orielton Lagoon is the most important area for migratory shorebirds in the Bruny Marine Bioregion (Bryant 2002). The shorebirds use the entire area of the wider Pitt Water system (Aquenal 2008), moving between sites according to tides, food supplies and weather conditions (P. Park pers.comm.).

Migratory shorebirds that regularly visit the Site include:
• eastern curlew (Numenius madagascariensis)
• bar-tailed godwit (Limosa lapponica)
• common greenshank (Tringa nebularia)
• curlew sandpiper (Calidris ferruginea)
• Pacific golden plover (Pluvialis fulva)
• double-banded plover (Charadrius bicinctus)
• red-necked stint (Calidris ruficollis).

More than 170 red-necked stints, one common greenshank and 30 Pacific golden plovers were observed during a 2012 survey (Woehler 2013). Orielton Lagoon is one of the few spots where great crested grebes (Podiceps cristatus) (listed as vulnerable under the Tasmanian Species Protection Act 1995) can be seen regularly.

The foreshore and islands are important feeding and breeding sites for pied oystercatchers and many seabirds, including terns and gulls. Within the Site, Woody Island, Barren Island and Susie Islet are important refuges and roosting sites for many birds. Barren Island is an important breeding site for Pacific gull (Larus pacificus), silver gull (Larus novaehollandiae), Caspian tern (Hydroprogne caspia) and crested tern (Sterna bergii). (PWS 2013). Pied oystercatchers (Haematopus longirostris) are a resident species that are abundant around the Site and form a component of the nationally significant population of this species in the wider Derwent Estuary area. A 2012 survey observed 62 breeding pairs of pied oystercatchers, which meets the 1% threshold for Criterion 6 (Woehler 2013).

The critically endangered swift parrot (Lathamus discolour) is a transient visitor to the Site.

Pitt Water-Orielton Lagoon is important for fish diversity. Upper Pitt Water is recognized as a Shark Refuge Area under the Living Marine Resources Management Act 1995, Tasmania. It is important as the most significant shark breeding area in southern Tasmania. A vulnerable endemic viviparous starfish (Parvulastra vivipara) has its stronghold in the Site, and only occurs within the Bruny Bioregion.

Optional text box to provide further information

The Site may meet criterion 6 for the pied oystercatcher (Haematopus longirostris). Pied oystercatchers are abundant around the site. A 2012 survey observed 62 breeding pairs (124 individuals) of pied oystercatchers, which exceeds the 1% threshold (110 birds) for Criterion 6 (Woehler 2013).

Further surveys are required to demonstrate that the Site regularly supports 1% of the population of this species.

☑ Criterion 8 : Fish spawning grounds, etc.

Justification

Pitt Water-Orielton Lagoon has been identified as the most important breeding ground in the Bruny Marine Bioregion for several species of shark (CSIRO 1993, Healey 1996, Aquenal 2000). Pitt Water is part of the Frederick Henry Bay and Norfolk Bay declared Shark Refuge Area under the Living Marine Resources Management Act 1995 Tasmania.

Several shark species migrate to the sandy bays of the upper Pitt Water for breeding and sheltered habitat for the juveniles (CSIRO 1993, Healey 1996). Pitt Water is a key breeding area for school shark (Galeorhinus galeus) and gummy shark (Mustelus antarcticus), the main target species for the southern shark fishery (Aquenal 2000).

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

Optional text box to provide further information

Pitt Water-Orielton Lagoon is the stronghold for the endemic seastar (Parvulastra vivipara). The total population of this species is estimated at about 350,000. The species is limited to about 13 sites, of which Pitt Water-Orielton Lagoon hosts the greatest numbers (Prestedge 1998). Estimates of the percentage of the total population suggest some 92% of the population occurs in the Pitt Water area, of which around half (or 45% of the total population) would occur within the Site boundary (Department of the Environment 2022).

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

Phylum	Scientific name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
Plantae								
TRACHEOPHYTA / MAGNOLIOPSIDA	*Calocephalus citreus*	☐	☑	☐		☐	State listed (TSPA) - rare	This species is listed as rare at the state level under the Tasmanian Threatened Species Protection Act 1995 (TSPA). This species contributes to the biodiversity of the Site.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Calocephalus sonderi*	☐	☑	☐		☐	State listed (TSPA) - rare	This species is listed as rare at the state level under the Tasmanian Threatened Species Protection Act 1995 (TSPA). This species contributes to the biodiversity of the Site.
TRACHEOPHYTA / LILIOPSIDA	*Lepilaena preissii*	☐	☑	☐		☐	State listed (TSPA) - rare	This species is listed as rare at the state level under the Tasmanian Threatened Species Protection Act 1995 (TSPA). This species contributes to the biodiversity of the Site.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Limonium australe*	☐	☑	☐		☐	State listed (TSPA) - rare	This species is listed as rare at the state level under the Tasmanian Threatened Species Protection Act 1995 (TSPA). This species contributes to the biodiversity of the Site.
TRACHEOPHYTA / LILIOPSIDA	*Stuckenia pectinata*	☐	☑	☐	LC	☐	State listed (TSPA) - rare	This species is listed as rare at the state level under the Tasmanian Threatened Species Protection Act 1995 (TSPA). This species contributes to the biodiversity of the Site.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Wilsonia humilis*	☐	☑	☐		☐	State listed (TSPA) - rare	This species is listed as rare at the state level under the Tasmanian Threatened Species Protection Act 1995 (TSPA). This species contributes to the biodiversity of the Site.

Five plant species in this area are considered of particular significance because of their threatened status in Tasmania. Pitt Water-Orielton Lagoon is a key site for their conservation. The daisy, lemon beauty-head (Calocephalus citreus), slender water-mat (Lepilaena preissii), silky wilsonia (Wilsonia humilis), fennel pondweed (Stuckenia pectinata), and sea lavender (Limonium australe) are listed as rare under the Tasmanian Threatened Species Protection Act 1995 (TSP Act).

Aquatic vegetation in the Site and surrounding area primarily consists of seagrasses. Zostera muelleri occurs on intertidal flats and shallow areas, Tasman grasswrack (Heterozostera tasmanica) on beds and channels, and seatassel (Ruppia spp.) where freshwater flushing occurs (Rees 1994). Seagrass cover in Pitt Water suffered a massive decline between 1953 and 1990, thought to be due to increased nutrient levels and sedimentation. The extent of decline had serious implications for the overall biodiversity of the area, including food supplies and critical nursery habitat for many marine species, some of which are commercially important outside the nature reserve (Parks and Wildlife Service 2013).

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																	
ECHINODERMATA / ASTEROIDEA	*Parvulastra vivipara*	☑	☐	☐	☑	☑	☐	☐	☐	157000		45		☐	☐	Nationally listed (EPBC Act) – vulnerable	Nationally listed threatened species. The total population of this species is approx. 350,000, with an estimated 45% occurring within the Site.
ARTHROPODA / INSECTA	*Theclinesthes serpentata lavara*	☐	☐	☐	☐	☑	☐	☐	☐					☐	☐	State listed (TSPA) - rare	This species is listed as rare at the state level under the Tasmanian Threatened Species Protection Act 1995 (TSPA). This species contributes to the biodiversity of the Site. Saltmarsh within the Site provides habitat for this species.
Fish, Mollusc and Crustacea																	
CHORDATA / ELASMOBRANCHII	*Galeorhinus galeus*	☑	☑	☐	☐	☑	☐	☐	☑				CR	☐	☐	Nationally listed (EPBC Act) – conservation dependent.	Internationally listed threatened species. The Site provides breeding and nursery habitat for this species.
CHORDATA / ELASMOBRANCHII	*Mustelus antarcticus*	☐	☑	☐	☐	☑	☐	☐	☑				LC	☐	☐		The Site provides breeding and nursery habitat for this species.
Birds																	
CHORDATA / AVES	*Calidris ferruginea*	☐	☑	☐	☐	☑	☐	☐	☐				NT	☐	☐	Nationally listed (EPBC Act) – migratory	This species is migratory (East Asian-Australasian flyway (EAAF)). It uses the Site for non-breeding habitat and as a stopover point during migration. Tasmania is the southernmost migration point in the EAAF.
CHORDATA / AVES	*Calidris ruficollis*	☐	☑	☐	☐	☑	☐	☐	☐				NT	☐	☐	Nationally listed (EPBC Act) – migratory	This species is migratory (East Asian-Australasian flyway (EAAF)). It uses the Site for non-breeding habitat and as a stopover point during migration. Tasmania is the southernmost migration point in the EAAF.
CHORDATA / AVES	*Charadrius bicinctus*	☐	☑	☐	☐	☑	☐	☐	☐				NT	☐	☐	Nationally listed (EPBC Act) – migratory	This species migrates between Australia and New Zealand. It nests in New Zealand and uses the Site for non-breeding habitat.
CHORDATA / AVES	*Charadrius ruficapillus*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		The Site provides important feeding habitat for this species. This species contributes to the biodiversity of the site.
CHORDATA / AVES	*Haematopus longirostris*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐		The foreshore and islands are important feeding and breeding sites for this species. This species contributes to the biodiversity of the Site.
CHORDATA / AVES	*Hydroprogne caspia*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐		Barren Island is an important breeding site for this species. This species contributes to the biodiversity 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								
CHORDATA / AVES	*Larus pacificus*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐		Barren Island is an important breeding site for this species. This species contributes to the biodiversity of the Site.
CHORDATA / AVES	*Limosa lapponica*	☐	☑	☐	☐	☑	☐	☐	☐				NT	☐	☐	Nationally listed (EPBC Act) – migratory	This species is migratory (East Asian-Australasian flyway (EAAF)). It uses the Site for non-breeding habitat and as a stopover point during migration. Tasmania is the southernmost migration point in the EAAF.
CHORDATA / AVES	*Numenius madagascariensis*	☑	☑	☐	☐	☑	☐	☐	☐				EN	☐	☑	Nationally listed (EPBC Act) – critically endangered, migratory	Nationally and internationally listed threatened species. This species is migratory (East Asian-Australasian flyway (EAAF)). It uses the Site for non-breeding habitat and as a stopover point during migration. Tasmania is the southernmost migration point in the EAAF.
CHORDATA / AVES	*Numenius phaeopus*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC Act) – migratory	This species is migratory (East Asian-Australasian flyway (EAAF)). It uses the Site for non-breeding habitat and as a stopover point during migration. Tasmania is the southernmost migration point in the EAAF.
CHORDATA / AVES	*Podiceps cristatus*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	State listed (TSPA) - rare	This species is listed as rare at the state level under the Tasmanian Threatened Species Protection Act 1995 (TSPA). It uses the Site as a drought refuge and contributes to the biodiversity of the Site.
CHORDATA / AVES	*Poliocephalus poliocephalus*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐		This species uses the Site as a drought refuge. It contributes to the biodiversity of the Site.
CHORDATA / AVES	*Sternula nereis nereis*	☑	☐	☐	☐	☐	☐	☐	☐					☐	☐	Nationally listed (EPBC Act) – endangered	Sternula nereis is listed as vulnerable at the international level (IUCN). The subspecies Sternula nereis nereis occurs at the Site and is listed nationally as endangered.
CHORDATA / AVES	*Thalasseus bergii*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐		Barren Island is an important breeding Site for this species. This species contributes to the biodiversity of the site.
CHORDATA / AVES	*Tringa nebularia*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC Act) – migratory	This species is migratory (East Asian-Australasian flyway (EAAF)). It uses the Site for non-breeding habitat and as a stopover point during migration. Tasmania is the southernmost migration point in the EAAF.

1) Percentage of the total biogeographic population at the site

Chequered blue butterfly:
Saltmarsh in the Site provides habitat for the chequered blue (or saltbush blue) butterfly (Theclinesthes serpentata lavara), listed in Tasmania as rare under the Threatened Species Protection Act Tasmania 1995. The distribution of this species in Tasmania is restricted to coastal habitats (P.McQuillan pers.comm. 19/1/09). The saltbush blue larva feeds on Rhagodia and similar saltmarsh plants in the upper zones of saltmarshes (PWS 2013).

Sharks:
A shark pup survey in Tasmania found the most significant numbers of juvenile school sharks in Pitt Water (Aquenal 2000). Pregnant school sharks move into shallow waters in late spring to early summer to give birth in shallow sandy bays near Shark Point. The presence of seagrass is considered important as feeding and shelter for the newborn sharks (Dunn 2012).

Birds:
The double-banded plover is a migratory species which is the only east-west migratory species in the Site. It nests in New Zealand and over-winters in Australia. It occupies similar habitats and uses similar food resources as East Asian-Australasian Flyway migratory shorebirds during their absence in the southern hemisphere winter months. The preferred feeding and roosting areas for double-banded plovers are the intertidal flats and open saltmarshes at the head of Orielton Lagoon and the sheltered bays surrounding Barilla Bay where tidal exposure offers an expanse of mudflat (Dunn 2012).

Red-capped plovers are recorded from Barilla Bay and Orielton Lagoon in all seasons. Red-capped plovers select sheltered sites at Barilla and the northern end of Orielton Lagoon for nesting, roosting, and feeding (Dunn 2012).

Pied oyster catchers nest on shorelines on the eastern side of Orielton Lagoon, in the bay north of Shark Point in upper Pitt Water, on the spit at Railway Point in Barilla Bay and in the north-east and south-west corners of Orielton Lagoon (P Park pers. comm.). Pied oyster catchers also nest in more exposed areas around the site including around Iron Creek estuary and south of the first causeway at Pitt Water Bluff. The adjacent shorelines and intertidal flats provide a food supply and roosting areas (Dunn 2012).

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	☑	Coastal saltmarsh consists mainly of salt-tolerant vegetation (halophytes) including grasses, herbs, sedges, rushes, and shrubs. In Australia, the vascular coastal saltmarsh flora may include many species (well over 100) but only a few families.	Nationally listed threatened ecological community (EPBC).

Optional text box to provide further information

Saltmarsh communities are an important connection or bridge between the aquatic and terrestrial environments and exhibit tolerance to fluctuation in salinity and degrees of exposure and dehydration. Saltmarshes form a critical component of the Site, not only for their biological values but also in the roles which they play in sedimentary processes and hydrology of the shoreline.

Areas of saltmarsh occur extensively around the shoreline of Pitt Water estuary and Orielton Lagoon. Marshes line the shoreline of the estuary towards the mouth of the Coal River but being above high water mark, they lie outside the Site's boundary. However, the entire suite of marshes demonstrates and contributes to the ecological character of the Pitt Water-Orielton Lagoon estuarine wetland ecosystem. Several marshes and two marshy islands lie within the Ramsar boundary.

The saltmarshes exhibit different floristic community facies controlled by topography, salinity, inundation, hydrology, and drainage patterns. Some saltmarsh units are dominated by low-growing succulent saltmarsh species (Sarcocornia spp), a few are largely shrubby dominated by Tecticornia arbuscula (formerly Sclerostega arbuscula). Species tolerant of low salinity such as Juncus krausii may fringe the landward edge of saltmarsh or on a saltmarsh dune face. Such communities also extend on the shoreline at the upper limits of the estuary near Richmond. Saltmarshes within the site boundary include two islands, one in the mouth of the Coal River (Samphire Island), the other an unnamed island in Barilla Bay.

The region contains one of the most significant areas of saltmarsh in Tasmania (Kirkpatrick and Glasby 1981). Saltmarshes host a diverse invertebrate fauna. They provide cover, roosting areas and food for foraging birds and even small mammals. The saltmarshes of Pitt Water-Orielton Lagoon have particular significance for migratory and resident shorebirds which forage and roost in these areas. (Dunn 2012).

Coastal habitats such as saltmarsh and seagrass are blue carbon ecosystems and play an important role in sequestering carbon. More information about the Subtropical and Temperate costal saltmarsh can be found at:
https://www.environment.gov.au/biodiversity/threatened/communities/pubs/118-conservation-advice.pdf

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

4.1 - Ecological character

The critical components and processes of the Pitt Water Orielton Lagoon include:

• hydrology – the hydrology of Pitt Water is dominated by marine influence. The estuary has massive tidal flows and high exchange rates. The site receives low but variable freshwater inflows from the ephemeral Coal River.

• water quality – at the time of listing, water quality was known to vary depending on climatic conditions. As tidal exchange is limited, the lagoon can become fresh under heavy rainfalls. Salinity can vary from fresh to hypersaline. Nitrogen levels may be high, depending on rainfall and temperature.

• seagrass and other aquatic primary producers – seagrass plays an important role in providing habitat and feeding areas for invertebrates, fish, and waterbirds. Seagrasses provide specialized habitats for sygnathids (seahorses and pipefish), and invertebrate fauna associated with seagrasses provide an important food source for other fish species. Phytoplankton plays an important role in the nutrient dynamics of the estuarine systems and is a useful indicator of ecosystem health and nutrient balance.

• fish communities – 40 species of fish have been recorded from within the site. The range of species recorded reflects the different habitats within the estuary and the seasonal occurrence of some species. Several hark species migrate to the sandy bays of the upper Pitt Water for breeding and the sheltered nursery habitat for juveniles. Pitt Water is a key breeding area for school shark (Galeorhinus galeus) and gummy shark (Mustelys antarcticus), the main target species for the southern shark fishery.

• invertebrates – form a food source for fish and birdlife within the Site. Invertebrates within the intertidal flats rework sediments, releasing organic matter and enabling microbial activity. Within the saltmarsh, the invertebrate community is likely to be comprised of 4 species of crustacean and 5 species of molluscs.

• waterbirds – the wetland provides habitat for a range of birdlife including waterfowl, seabirds, resident, and migratory shorebirds. Migratory shorebirds use the site during the (northern) winter. The Site acts as a refuge for large numbers of waterfowl in times of drought. Orielton Lagoon is considered a priority site in the Bruny Marine Bioregion for beach nesting. The Site provides a diversity of food sources including open water, shallow bays, intertidal flats, rocky and sandy shorelines, and saltmarshes. Rocky shorelines, saltmarshes, shrubby headlands, and islands provide nesting and roosting areas.

• saltmarsh – hosts a diverse invertebrate fauna. They provide cover, roosting areas and food for foraging birds and even small mammals. The saltmarshes of Pitt Water-Orielton have particular significance for the migratory and resident shorebirds which forage and roost in these areas. Saltmarsh plays a role in sedimentary processes and hydrology of the shoreline. Areas of saltmarsh occur extensively around the shoreline of Pitt Water estuary and Orielton Lagoon.
(Dunn 2012).

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)	Pitt Water	4	100	
D: Rocky marine shores	Duckhole rivulet	0	33	
E: Sand, shingle or pebble shores	Sorrell Point to Iron Creek Bay	0	33	
F: Estuarine waters	Pitt Water, Orielton Lagoon	1	1800	
G: Intertidal mud, sand or salt flats	Pitt Water, Orielton Lagoon	2	1234	
H: Intertidal marshes	Samphire Island, Duckhole rivulet, Orielton Lagoon	3	133	

(ECD) Habitat connectivity	Saltmarsh provides an important connection between the aquatic and terrestrial environments within the Site.

4.3 - Biological components

4.3.1 - Plant species

Invasive alien plant species

Phylum	Scientific name	Impacts	Changes at RIS update
TRACHEOPHYTA/MAGNOLIOPSIDA	*Lycium ferocissimum*	Potential	unknown
TRACHEOPHYTA/MAGNOLIOPSIDA	*Osteospermum moniliferum moniliferum*	Potential	unknown
TRACHEOPHYTA/MAGNOLIOPSIDA	*Rubus fruticosus*	Potential	unknown
TRACHEOPHYTA/MAGNOLIOPSIDA	*Ulex europaeus*	Potential	unknown

Optional text box to provide further information

Invasive species:
Many introduced plant species have been recorded within the site, including species such as African boxthorn Lycium ferocissimum and Plantago coronopus, which can invade the saltmarsh fringe, and numerous marine pests occur within the wider Derwent Estuary area (Aquenal 2008a). African boxthorn Lycium ferocissimum is now widespread at the landward limits of the marshes (Dunn 2012).

4.3.2 - Animal species

Other noteworthy animal species

Phylum	Scientific name	Pop. size	Period of pop. est.	% occurrence	Position in range /endemism/other
CHORDATA/AVES	*Aquila audax fleayi*				Nationally and internationally listed threatened species (EPBC Act – vulnerable, IUCN - vulnerable). This species occurs within the Ramsar site but it is unclear whether it is wetland dependent.
CHORDATA/AVES	*Lathamus discolor*				Nationally and internationally listed threatened species (EPBC and IUCN). This species migrates between Tasmania and mainland Australia. This species occurs within the Ramsar site but is not wetland dependent.

Invasive alien animal species

Phylum	Scientific name	Impacts	Changes at RIS update
MOLLUSCA/BIVALVIA	*Magallana gigas*	Potential	unknown

Optional text box to provide further information

Noteworthy fauna:
The Site is considered important for conservation of coastal birdlife of the Tasmanian South-East Bioregion and Bruny Marine Bioregion. Orielton Lagoon is one of the few spots where great crested grebes (Podiceps cristatus) can be seen regularly. This species is listed as rare under the Tasmanian Threatened Species Protection Act 1995.

The swift parrot (Lathamus discolor) (EPBC – critically endangered, IUCN – critically endangered) is a transient visitor to the Ramsar site and is not considered to be a wetland dependent species. It breeds in colonies in blue gum forest of south-east Tasmania. The entire population migrates to the mainland for winter. (DoE 2022e).

The Tasmanian wedge-tailed eagle (Aquila audax fleayi) (EPBC – endangered) has been recorded within the Site. This species is a habitat generalist, using whatever habitat is available within its territory. As such, it is unclear whether this species should be considered wetland dependent. It occurs in a wide variety of habitats including dry sclerophyll forest, temperate rainforest, sub-alpine forest, dry woodland, coastal heathland, small wetlands, riparian vegetation, sedgeland, grassland and farmland. (DoE 2022f).

The saltmarshes around Barilla Bay are one of the few recorded localities of the Tasmanian endemic chequered blue butterfly (Theclinesthes serpentata lavara), which is listed as rare under the Tasmanian Threatened Species Protection Act 1995.

Invasive species:
Pitt Water is thought to be currently relatively free of major marine pests although feral Pacific oysters (Crassostrea gigas), introduced several decades ago, are established. The waters are exposed to invasion by marine pest species (including several listed on National Control Plans) infesting the nearby Derwent estuary and other southern coastal waters. These inlcude: Northern Pacific seastar (Asterias amurensis), Wakame or Japanese seaweed (Undaria pinnatifida), European clam (Varicorbula gibba), European green crab (Carcinus maenas) Asian date mussel (Musculista senhousia), and fan worm (Sabella spallanzanii). The first four of these species are established on the southeast coastline of Tasmania, including the Derwent estuary.

Dogs, cats, rats and rabbits are present in parts of the Site.

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)

Tasmania has four distinct seasons with the warmest months being December to March. The average maximum daily summer temperatures are between 17 and 23°C and winter daily temperatures sit between 3 and 11°C. Rainfall varies across the state. The general rainfall pattern is evenly spread throughout the year, with slightly higher falls in the summer months (December to February) when the evaporation rate is high.

According to BoM and CSIRO (2022) climate projections for Southern slopes (Tasmania east) region, average temperatures are projected to increase in all seasons with more hot days and warm spells. Fewer frosts are projected. Less rainfall in spring and little change or an increase in winter rainfall is projected. Changes to summer and autumn rainfall are possible but less clear. Increased intensity of extreme rainfall events is projected.

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres): 0

a) Maximum elevation above sea level (in metres): 20

- 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.

Pitt Water sits within the Coal River catchment and forms the estuary of the Coal River. Pitt Water is part of the larger Derwent Estuary system.

Several smaller rivers and creeks feed into Pitt Water, the largest being Orielton Rivulet.

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 ◉

Please provide further information on the soil (optional)

Most of the low-lying land around Pitt Water is of recent alluvial or aeolian origin. Pitt Water formed as the sea-level rose between 6,000 to 10,000 years ago and drowned the mouth of the Coal River.

The underlying rock type is mostly Jurassic dolerite (Davies 1997). In the few places where rocky outcrops extend to the edge of the lagoon (e.g. Midway Point), the geology consists of Triassic sandstone. Tertiary basalt occurs at the eastern side of Orielton Lagoon at Sorell and extends past Sorell Rivulet. Outcrops of basalt also occur on the western side of Orielton Lagoon. Soils around Orielton Lagoon are susceptible to tunnel and gully erosion. Most of the surrounding hills consist of Jurassic dolerite with outcrops extending to the water in some locations.

Acid sulfate soils (ASS) probability mapping of the area has shown that the Pitt Water reserve and some of the surrounding area contain potential acid sulfate soils (PASS) that are currently in an undisturbed state
(PWS 2013).

4.4.4 - Water regime

Water permanence

Presence?	Changes at RIS update
Usually seasonal, ephemeral or intermittent water present	unknown
Usually permanent water present	No change

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	decrease

Stability of water regime

Presence?	Changes at RIS update
Water levels fluctuating (including tidal)	unknown

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

Pitt Water is a large wave-dominated estuary. The estuary is generally shallow, reaching greatest depths of about 8m in the main channels (Mount et al 2005, Dunn 2012).

The Site receives freshwater flows from the Coal River and Sorell Rivulet into Pitt Water, Orielton Rivulet and Frogmore Creek into Orielton Lagoon, and Iron Creek into Iron Creek Bay. There are also some unnamed minor tributaries and drainage channels. The catchment is subject to flooding and flow rates vary considerably throughout the year (PWS 2013).

The natural tidal flows, freshwater flows and sediment processes have been altered by catchment development and the construction of causeways that act as solid barriers across most of the open mouths of the two major bays: the Coal River and Orielton Lagoon (Dunn 2012).

It is likely that Craigbourne Dam (constructed in 1985) had a significant ecological impact on flows. Summer flows from the Coal River into Pitt Water are now generally higher than would have occurred naturally (Fuller 1996, Gallagher 1998). Before being dammed, the Coal River often ceased to flow during the summer months (Gallagher 1998). Since it was dammed, the river ceased to flow in drought years when the dam was empty (PWS 2013).

(ECD) Connectivity of surface waters and of groundwater	Coal River flows are supplemented by groundwater contributions. Groundwater contribution is thought to be significant but have not been measured (Davies et al 2002, Dunn 2012).
(ECD) Stratification and mixing regime	The estuary has a massive tidal flow (with a tidal prism of ~23.4 GL) and high exchange rate, ensuring mixing of waters, homogenising temperature, salinity and nutrients. Flushing time for the entire estuary is approximately 4.36 tidal cycles (Dunn 2012)

4.4.5 - Sediment regime

Sediment regime unknown ☑

Please provide further information on sediment (optional):

Sediments within the Pitt Water estuary are comprised of mostly fine sands, with medium sediments in deeper channels (due to sorting by active tidal flows). In the upper reaches of the estuary there is evidence of clay and silt deposited by river flows. These are areas of particularly active sediment movement likely to be affected by changes in hydrology (Dunn 2012).

In the catchment of Orielton Lagoon, Kinhill (1993) noted significant gully and sheet erosion and streamside erosion due to unrestricted stock access. Fine silt washed into Orielton Lagoon, depositing on the consolidated sands of the lagoon bed.

High river flows bring sediment into the lagoon, most of which is flushed through the lagoon (Kinhill 1993). The most significant sources of sediment supply are likely to be derived from shoreline erosion (I. Houshold pers comm.). Saunders et al (2007), using sedimentation core analysis, estimated a sedimentation rate for Orielton Lagoon of 0.2cm/ year (Dunn 2012).

(ECD) Water turbidity and colour	Turbidity at Orielton Lagoon shows seasonal variation but was consistently higher than at Pitt Water (Brett 1992).
(ECD) Water temperature	Orielton Lagoon temperatures range from 8°C in winter to 25 °C in January.

4.4.6 - Water pH

Unknown ☑

4.4.7 - Water salinity

Mixohaline (brackish)/Mixosaline (0.5-30 g/l) ☑

(Update) Changes at RIS update: No change ◉ Increase ○ Decrease ○ Unknown ○

Euhaline/Eusaline (30-40 g/l) ☑

(Update) Changes at RIS update: No change ◉ Increase ○ Decrease ○ Unknown ○

Unknown ☐

Please provide further information on salinity (optional):

The Pitt Water estuary is characterised by normal marine salinity (Crawford and Mitchell 1999).

The water quality in Orielton Lagoon up to and at the time of listing in 1982 was known to vary depending on climatic conditions. Since tidal exchange was limited, the lagoon could become almost fresh water under heavy rainfall conditions. At other times, evaporation could create hypersaline conditions. The effects of rainfall exacerbated fluctuating nutrient levels (Dunn 2012).

4.4.8 - Dissolved or suspended nutrients in water

Eutrophic ☑

(Update) Changes at RIS update: No change ○ Increase ○ Decrease ○ Unknown ◉

Mesotrophic ☑

(Update) Changes at RIS update: No change ○ Increase ○ Decrease ○ Unknown ◉

Unknown ☐

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

No data are available on water quality entering the estuary from the Coal River, Sorell Rivulet and Iron Creek at the time of listing. It is likely that nutrients would be carried in these waters given that they flow through land developed for agriculture.

The water quality in Orielton Lagoon up to and at the time of listing in 1982 was known to vary depending on climatic conditions. Since tidal exchange was limited, the lagoon could become almost fresh water under heavy rainfall conditions. At other times, evaporation could create hypersaline conditions. The effects of rainfall exacerbated fluctuating nutrient levels (Dunn 2012).

Nitrogen levels can be high in Orielton Lagoon, depending on heavy rainfall and temperature. Phosphorus levels are low but sufficient for plant growth. Chlorophyll levels are high throughout the year with peaks in late spring and autumn. Nutrient levels can lead to periodic noxious algal blooms (Dunn 2012).

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:

Pitt Water-Orielton Lagoon sits within a catchment that has been cleared and is used for primarily for agriculture. Part of the Ramsar site is a Nature Reserve and is managed accordingly.

Surrounding land use and the construction of causeways have impacted the Site for over 150 years. Land clearance for cropping began in the 1820s and various forms of intensive farming activities extended throughout the catchment. In the 1980s marine farming of oysters was introduced to several bays within the estuary, bringing some intensive new land-based activities to the shorelines.

The areas around the Site have seen considerable population growth, bringing opportunities for education and interpretation to a wide community but also the potential for further threats and pressures to the ecosystem (Dunn 2012).

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

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Pollution control and detoxification	Water purification/waste treatment or dilution	Medium

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Nature observation and nature-based tourism	Medium
Recreation and tourism	Recreational hunting and fishing	Medium
Recreation and tourism	Picnics, outings, touring	Medium
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	Medium

Other ecosystem service(s) not included above:

Ecosystem services include (but are not limited to):

• pollution control and detoxification – the Site stores and/or dilutes pollutants and nutrients entering the system from upstream land use, including stormwater and treated effluent.

• moderating impacts of climate change (sea level rise) – narrow channels and causeways may dampen the effects of sea level rise. Baffles in existing culverts may be manipulated to protect shorebird habitat from the impacts of sea level rise.

• nutrient cycling – the Site plays a role in cycling and discharge of nutrients from the surrounding catchments.

• sediment cycling - tidal movement, wave action in Orielton Lagoon, and freshwater flows resuspend and recycle sediments and maintain sedimentary environments.

• maintenance of biodiversity – the diversity of supratidal, intertidal and subtidal habitats supports the diversity of marine life and shorebirds. The site supports a range of ecological communities including fish, saltmarsh vegetation, invertebrates of saltmarsh, intertidal flats and benthic environments.
(Dunn 2012).

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	Seagrass (Zostera muelleri, and Ruppia sp) provides food and habitat for invertebrates, fish and birds. Diatoms and nannoplankton dominate the phytoplankton at the site (Hallegreaff and Tyler 1987). Diatoms form a major source of food for oysters.
(ECD) Nutrient cycling	The Site plays a role in cycling and discharging nutrients from the surrounding catchments. Oversupply of nutrients from the catchment causes algal blooms that may be toxic.
(ECD) Animal reproductive productivity	Pitt Water is a key breeding area for school shark Galeorhinus galeus and gummy shark Mustelus antarcticus.
(ECD) Vegetational productivity, pollination, regeneration processes, succession, role of fire, etc.	The diversity of saltmarsh vegetation is likely to provide habitat for a range of crustaceans and molluscs. The structural vegetation is known to host a number of species of spider and other more mobile invertebrates.
(ECD) Notable species interactions, including grazing, predation, competition, diseases and pathogens	Invertebrates of the intertidal flats provide a critical food source for shorebirds. Seagrass provides specialised habitat for syngnathids (seahorses, pipefish) and invertebrate fauna which provides an important food source for other fish species.
(ECD) Notable aspects concerning animal and plant dispersal	The endemic viviparous seastar, Parvulastra vivipara lacks ability to use tides and currents for widespread dispersal due to its live-bearing reproductive behaviour. As a result, it has a very limited distribution.
(ECD) Notable aspects concerning migration	Several shark species migrate to the sandy bays of the upper Pitt Water for breeding and sheltered habitat for the juveniles (CSIRO 1993, Healey 1996). Orielton Lagoon is the most southerly site for migratory shorebirds in the EAAF.

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	☑	☐
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):

Most of the Site is publicly owned and comprises Crown Land (102 ha), Marine Crown Land (1,450 ha), Tidal Crown Land (769 ha), and Unclassified Crown Land (952 ha). Part of the Ramsar site, the Pitt Water Nature Reserve (826 ha), is a declared Nature Reserve under the Tasmanian Nature Conservation Act 2002.

Two parcels of land covering 46 ha, are on private land. One is in the Duckhole Rivulet area and one at the mouth of Iron Creek.

The surrounding area is private freehold.

5.1.2 - Management authority

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

Parks and Wildlife Service (Southern Region)

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

No name specified

Postal address:

Parks and Wildlife Service - Head Office
GPO Box 1751
Hobart, Tasmania 7001, Australia
Telephone: +61 3 6165 4396 / 1300 827 727

Parks and Wildlife Service - Southern Regional Office
1-2 Murrayfield Court, Glenorchy Tasmania 7010
PO Box 126, Moonah, Tasmania 7009
Telephone: +61 3 6165 4053

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	unknown impact	unknown impact	☐	unknown	☑	unknown

Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Drainage	unknown impact	unknown impact	☑	unknown	☐	unknown
Water abstraction	Low impact	Low impact	☐	No change	☑	No change

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Marine and freshwater aquaculture	unknown impact	unknown impact	☑	unknown	☐	unknown
Livestock farming and ranching	unknown impact	unknown impact	☑	unknown	☐	unknown

Transportation and service corridors

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Roads and railroads	Low impact	Low impact	☑	No change	☑	No change

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	Low impact	Low impact	☑	No change	☐	No change

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Unspecified/others	unknown impact	unknown impact	☑	unknown	☐	unknown
Dams and water management/use	Low impact	Low impact	☐	No change	☑	No change

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	Low impact	Low impact	☑	No change	☐	No change

Pollution

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

Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Storms and flooding	unknown impact	High impact	☐	No change	☑	No change

Please describe any other threats (optional):

Threats to the Site include:

• agriculture – irrigation practices, stock management and ground water manipulation on adjacent agricultural land impact on saltmarshes, seagrass, hydrology, sediment and water quality. Gully erosion, prevalent around Orielton Lagoon, can contribute sediment straight into the wetland. In addition to sedimentation, runoff from planted croplands, pastures and other agricultural areas with high fertiliser use may also contribute to increased nutrient loads in wetland. Nutrient (nitrogen, nitrate and phosphorus) levels in the Coal River are generally at low levels, however, a few high flow events can carry the majority of annual nutrient load (Gallagher 1998).

• stormwater runoff and groundwater seepage can contribute to changes in nutrient balance and water quality, especially in the almost enclosed Orielton Lagoon.

• overfishing could contribute to a loss in abundance and diversity of fish stocks.

• invasive species – based on the current distribution of introduced invertebrate aquatic species in Tasmanian waters, several species are potential threats to the reserve. They include the toxic dinoflagellate (Gymnodinium catanatum), the North Pacific seastar (Asterias amurensis), and European shore crab (Carcinus meanus).

• climate change – Prahalad (2009) suggests that climate change and sea-level rise are the biggest long-term threats to saltmarsh vegetation and bird habitat, with potential for changes to vegetation composition, erosion and salinity (PWS 2103).

• urban development – increasing numbers of subdivisions on the shores of Orielton Lagoon and Midway Point may contribute to increased run-off and sediments. Subdivisions can result in additional stormwater outlets, potential for dumping and spread of weed species, and general disturbance from noise, pets, and human activity. Some of the stormwater is partially treated. Some treatments allow only for the removal of solid pollutants such as litter, while others also reduce sediment and nutrient loads. Stormwater remains an increasing source of nutrients and a significant threat to the environmental quality of Orielton Lagoon.

5.2.2 - Legal conservation status

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Nature Reserve	Pitt Water Nature Reserve		partly
Shark Refuge Area	Upper Pitt Water		partly

Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	South East Tasmania	http://datazone.birdlife.org/site/factsheet/south-east-tasmania- iba-australia	partly
Other non-statutory designation	Name of area East-Asian – Australasian Flyway Network Site- EAFF014 - Orielton Lagoon	https://www.eaaflyway.net/austra lia/	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

Other:

In Australia, the ecological character of a designated Site is protected as a matter of national environmental significance (MNES) under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

Orielton Lagoon is listed in the Flyway Site Network of the East-Asian – Australasian Partnership. Three important areas of the Site are scheduled as Nature Reserve under the Nature Conservation Act 2002 Tasmania.

Upper Pitt Water is a Shark Refuge Area under the Living Marine Resources Management Act 1995, Tasmania. Hunting or disturbing wildlife is prohibited in the Nature Reserves under the Tasmanian wildlife regulations.

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 ◉

5.2.6 - Planning for restoration

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

Further information

Whilst there is no site-specific restoration plan, the Pitt Water Nature Reserve Management plan 2013 guides management and therefore restoration actions.

The Sorell Stormwater Management Plan 2020 (Sorell Council) is a guidance document to manage storm water, in particular water quality issues within the local catchment, including within Orielton Lagoon and Pitt Water (https://www.sorell.tas.gov.au/wp-content/uploads/2021/09/Sorell-Stormwater-System-Management-Plan.p df).

NRM South is a local natural resource management organisation that aims to protect, sustainably manage and improve our natural resources for the shared environmental, social and economic benefit of the community.

In 2011, NRM South undertook restoration works on 50 ha of private land adjacent to the Ramsar site. Key activities included weeding and revegetation across farmland and saltmarsh; and fencing to exclude stock from 25 ha of saltmarsh.

In 2015, NRM South partnered with Sorrell Council to support a Local Area Facilitator to work with Conservation Volunteers Australia to mitigate tunnel erosion on the foreshore of Pitt Water-Orielton Lagoon in Mienna Park. The work was a great success and Sorrell Council plans to use this model as part of a holistic approach to stormwater management (see: https://nrmsouth.org.au/back-on-solid-ground-ramsar-restoration-at-pitt-water-orielton-lagoon/).

In 2015, NRM South awarded a 'Naturally Inspired Grant' to the Friends of Pitt Water-Orielton Lagoon Wildcare Group to conduct weeding on Woody Island, an important bird refuge (see: https://nrmsouth.org.au/next-stop-pitt-water-orieltop-lagoon/).

In 2015-2016, NRM South and Landcare Tasmania recruited 3 consecutive Green Army teams to work on projects across a diversity of sites including Pitt Water-Orielton and saltmarsh areas (see: https://nrmsouth.org.au/projects/green-army/).

NRM South currently implements the Fisheries Habitat Restoration program (DAWE, 2021-2023) that aims to restore essential fish habitat within the saltmarshes of the Pitt Water-Orielton Lagoon Ramsar site. NRM South is working with project partners and landholders to restore saltmarsh habitat with works designed to restore natural flows and provide protection to modified saltmarsh habitat (https://nrmsouth.org.au/saltmarsh-fisheries-restoration-pwol/)
(Source: NRM South website and pers. comm. 2022)

5.2.7 - Monitoring implemented or proposed

BirdLife Tasmania is the primary organisation involved in undertaking shorebird monitoring (see: https://www.birdlife.org.au/locations/birdlife-tasmania/projects-initiatives-tas). They work with NRM South and the South East Regional Shorebird Alliance (see: https://nrmsouth.org.au/sersa/) to protect shorebird habitat and in raise awareness of the threats to shorebird populations across southern Tasmania.

Surveys and mapping undertaken by BirdLife Tasmania have raised the question of whether the Pitt Water-Orielton Lagoon also meets criterion 6. BirdLife Tasmania data indicates that the site supports a significant proportion of the population Pied Oystercatchers. Further examination is required to confirm whether the site "regularly" supports more than 1% of the population of this species.

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

This RIS has been prepared using information from the Pitt Water Orielton Lagoon Site Ecological Character Description; the Pitt Water Nature Reserve Management Plan; past Ramsar Information Sheets; and other key information sources. A full bibliography is included as an attachment under 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
<1 file(s) uploaded>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:

Aerial view of the Pitt Water-Orielton Lagoon Ramsar Site. Photo by Jim Mollison. Date unknown. (*Department of the Environment, 01-01-1970*)

Orielton Lagoon Nature Reserve, Sorell Tasmania. Photo by Michelle McAulay. Date unknown. (*Department of the Environment, 01-01-1970*)

Pitt Water, near MC Gees Bridge. Photo by Michelle McAulay. Date unknown. (*Department of the Environment, 01-01-1970*)

6.1.4 - Designation letter and related data

Designation letter
<1 file(s) uploaded>

Date of Designation: 1982-11-16