Ramsar Information Sheet

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Australia

Lavinia Nature Reserve

Designation date	16 November 1982
Site number	253
Coordinates	39°43'06"S 144°04'23"E
Area	7 034,00 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 Lavinia Nature Reserve is 7034 hectares and lies on the north east coast of King Island, Tasmania. The Site contains significant and diverse ecosystems, including a lagoon and wetland system, coastal and bush landscapes. It comprises 4 ecosystem units:
• Sea Elephant Estuary: receives freshwater from the largest river on King Island (the Sea Elephant River) and drains into Bass Strait. The estuary includes a coastal lagoon and an actively developing sand spit. It contains significant areas of saltmarsh that provide feeding and roosting habitat for the orange-bellied parrot.
• Coastal Strip: covers the entire coast of the site. This ecosystem includes the coastal calcareous sand beaches of the site as well as the fore-dunes. The coastal strip contains important sea-bird rookeries and overlaps with the Sea Elephant Estuary Ecosystem
• Dunes: consists of three main sub-components – the new dunes, the old dunes and the interdunal swamps. Between the old and new dune systems are a series of lagoons, lakes wetlands and peatlands, forming in the Interdunal depressions.
• Northern Sandsheet: is a Quaternary sand plain which forms flat to undulating country inland of the dunes ecosystem. Vegetation of the ecosystem includes an extensive successional mosaic of sedgeland, heath and scrub and also heathy woodlands.

Lavinia meets Ramsar criteria 1, 2, 3, and 4:

1: The Site provides excellent examples of a variety of coastal and inland wetland types. The dunes along the coastal strip, and the Lavinia Peatland Complex have significant geo-conservation value at the state level. The Sea Elephant River Mouth is considered geomorphically significant at the district level.

2: It provides habitat for threatened species including the orange-bellied parrot, green and gold frog, brown thornbill (King Island subspecies), scrambling ground fern, ruddy turnstone, sharp-tailed sandpiper and common greenshank.

3: Lavinia supports regionally threatened flora and fauna species. Cowper Point supports a diversity of beach nesting and migratory shorebirds.

4: It provides a critical feeding site for the orange-bellied parrot during its annual migration between south-eastern Australia and Tasmania. The site supports internationally listed migratory species. The site supports breeding populations of little tern, fairy tern, hooded plover, Australian pied oystercatcher, little penguin and short-tailed shearwater.

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 Climate Change, Energy, the Environment and Water (DCCEEW)
Postal address	GPO Box 3090 Canberra ACT 2601 Australia

National Ramsar Administrative Authority

Institution/agency	Department of Climate Change, Energy, the Environment and Water (DCCEEW)
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	1982
To year	2022

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Lavinia Nature Reserve

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 Site was impacted by bushfires in 1992, 1996, 2001 and 2007. Over 90% of the Site was burnt by a bushfire in February 2007 during drought conditions. These fires resulted in significant loss of peat, and extensive loss of vegetation and habitat values. There has been recovery of many of these vegetation and habitat values, although the extent and condition of swamp forest has been reduced. The localised loss of extensive deposits of peat soils in some areas is a long-term change that is likely to take hundreds to years to recover. Note that this change was due to natural circumstances (drought and fire) and therefore was not reported under Article 3.2.

The Site has also been subject to a changing climate. Australia has warmed by an average of 1.47°C since 1910. Sea surface temperatures have risen by an average of 1.05°C, leading to an increase in the frequency of extreme heat events over land and sea. Australia is projected to experience further increases in temperatures, with more extremely hot days and fewer extremely cool days over the coming decades under all emissions scenarios. Warming over Australia is projected to be slightly higher than the global average (BOM and CSIRO, State of the Climate 2022). 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 to guide wetland management under a changing climate is continually evolving. Relevant sections of the RIS will be reviewed and updated as new information becomes available.

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 Ramsar Site is part of the Lavinia State Reserve which is reserved under the Tasmanian Nature Conservation Act 2002. It is situated between Boulder Point at its northern end and Cowper Point, approximately 12 km north of Naracoopa, at its southern end. The northern section of the Site extends approximately 8 km inland. Its boundary to the east is Bass Strait and boundaries to the north, south and west contain a mixture of freehold land and unallocated Crown land (PWS 2000).
The boundary of Lavinia Nature Reserve Ramsar Site is shown as Lot 1 on Central Plan Register (CPR) 5651 from the Tasmanian Information and Land Services, Department of Primary Industries, Water and Environment. CPR 5651 horizontal datum is Australian Geodetic Datum (AGD66) Universal Transverse Mercator Projection Australian Map Grid (UTM AMG66) and Australian Height Datum (Tasmania) for vertical datum.
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 Section 5.1.1 (Land tenure/ownership) provides more information about the history of the Site boundary.

2.2.2 - General location

a) In which large administrative region does the site lie? The Lavinia Nature Reserve Ramsar Site lies within the King Island municipality of Tasmania.

b) What is the nearest town or population centre? The town of Yambacoona (population 41 in 2021) lies approximately 13km west of the Ramsar Site.

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): 7034

Area, in hectares (ha) as calculated from GIS boundaries: 7028.865

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Other scheme (provide name below)	Tasmanian Drainage Basin, King Island
Other scheme (provide name below)	Bass Strait Province, Otway
Other scheme (provide name below)	King, King

Other biogeographic regionalisation scheme

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

The Australian Hydrological Geospatial Fabric (Geofabric) is a specialised Geographic Information System (GIS). It registers the spatial relationships between important hydrological features such as rivers, water bodies, aquifers and monitoring points. The National Topographic Drainage Divisions and River Regions are currently derived from Geofabric version 2. These provide a set of surface water reporting units based on drainage-enforced digital elevation models and are used to depict where water flows and drains across the landscape.

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

The Integrated Marine and Coastal Regionalisation of Australia (IMCRA v4.0) is a spatial framework for classifying Australia's marine environment into bioregions that make sense ecologically and are at a scale useful for regional planning.

Commonwealth of Australia (2012). Interim Biogeographic Regionalisation for Australia, Version 7 – King, King. https://www.environment.gov.au/land/nrs/science/ibra/australias-bioregions-maps

The interim Biogeographic Regionalisation for Australia (IBRA) describes the biogeographic regions within Australia. Subdivisions of IBRA regions provide finer scale regions of the Australian landscape. Vegetation community and land system mapping undertaken by the states and territories have been used to establish IBRA Region and Subregion Boundaries. This information can potentially be used to identify regional ecosystems across Australia.

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

Hydrological services provided	The Site is a good example of a near-natural wetland complex in the King Island bioregion within the Tasmanian drainage division. It includes an estuary and associated samphire, mudflats, coastal swamps and lagoons. The hydrology and water quality of this ecosystem are critical to the ecological character of the Site. The provision of sufficient water from the Sea Elephant River is a key process for the estuary. The geomorphology (landforms) of this ecosystem and its surrounding landscape has a major influence on the hydrology of the system and on the highly diverse array of wetlands and vegetation types within the system. Similarly, the water quality of the estuary must be maintained for the fish and macroinvertebrates which form a food source for bird species at the Site.
Other ecosystem services provided	The Site includes areas of saltmarsh, which are recognised as blue carbon ecosystems. Blue carbon ecosystems sequester significant amounts of carbon dioxide from the atmosphere and oceans, contributing to climate change mitigation. They also protect the coastline from storms and sea level rise, prevent shoreline erosion and regulate coastal water quality (Conservation International 2019). Carbon is also stored in the fibric peat of the remaining swamp forests.

Other reasons	The Site is located in the King Island River Region in the Tasmanian Drainage Division, which covers the whole of Tasmania (Bureau of Meteorology 2012). The Site is one of the few largely unaltered areas of native vegetation remaining on King Island, containing wetland types that are representative or rare to the bioregion, including Melaleuca ericifolia swamp forest, freshwater aquatic wetlands, herbfields and grasslands marginal to wetland and sedge/rush wetland. The Ramsar Site contains 15 wetland types (7 marine/ coastal and 8 inland types): • Rocky marine shores (Ramsar type D) • Sand, shingle or pebble shores (E) • Estuarine waters (F) • Intertidal mud, sand or salt flats (G) • Intertidal marshes (H) • Coastal brackish/saline lagoons (J) • Coastal freshwater lagoons (K) • Permanent rivers/streams/creeks (M) • Permanent freshwater lakes (over 8 ha) (O) • Permanent freshwater marshes/pools (Tp) • Seasonal/intermittent freshwater marshes/pools on inorganic soils (Ts) • Non-forested peatlands (U) • Shrub-dominated wetlands (W) • Freshwater, tree-dominated wetlands (Xf) • Forested peatlands (Xp) The saltmarsh vegetation of the Sea Elephant Estuary (wetland type H) is also a good representative of this vegetation type for the bioregion, containing most saltmarsh formations and species found in Tasmania (Duncan 1986). Within the 'Saltmarsh' category graminoid saltmarsh and succulent saltmarsh have both been recorded within the Sea Elephant Estuary (Barnes et al. 2002). Sea Elephant Lagoon is very unusual, being formed within a dune swale between parallel dunes that are probably the longest and best-developed in Tasmania extending north from the Sea Elephant River mouth to Lavinia Point (Parks and Wildlife Service 2000). The sand dunes in this system have been classed as "outstanding" at a State level from a geo-conservation perspective (Dixon 1996). Research at Remarkable Banks on Robbins Island has found a similar set of beach ridges to be globally significant. That Site records the history of changing relative sea level, wave climate and coastal processes stretching back 125,000 years to the last interglacial (Goodwin et al 2023). The beach ridges around the lower end of Saltwater Creek and the Sea Elephant estuary potentially contain a similar record. The Lavinia Peatland Complex also has state level significance in the Tasmanian Geoconservation Database (TGD), (NRE Tas 2009), and the Sea Elephant Estuary is listed as having district level significance.

☑ Criterion 2 : Rare species and threatened ecological communities

The Site provides habitat for the following species and ecological community listed as threatened nationally under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), and/ or internationally under the IUCN Red List:
• green and golden frog, Litoria raniformis (EPBC - vulnerable, IUCN - endangered)
• orange-bellied parrot, Neophema chrysogaster (EPBC & IUCN - critically endangered)
• fairy tern, Sternula nereis nereis (EPBC & IUCN - vulnerable)
• eastern curlew, Numenius madagascariensis (EPBC - critically endangered, IUCN - endangered)
• King Island scrubtit, Acanthornis magna greeniana (EPBC - critically endangered)
• King Island brown thornbill, Acanthiza pusilla archibaldi (EPBC - endangered)
• sharp-tailed sandpiper, Calidris acuminata (EPBC & IUCN - vulnerable)
• white-throated needletail, Hirundapus caudacutus (EPBC - vulnerable)
• scrambling groundfern, Hypolepis distans (EPBC - endangered)
• swamp fireweed, Senecio psilocarpus (EPBC - vulnerable)
• ruddy turnstone, Arenaria interpres (EPBC - vulnerable)
• greenshank, Tringa nebularia (EPBC - endangered)

The frogs at the Site require permanent water, aquatic vegetation and good invertebrate populations found in the swamp habitats in the dunes and other ecosystem types. The Site is a key refuge for the green and golden frog.

Optional text box to provide further information

The King Island scrubtit and King Island brown thornbill are island endemic subspecies, confined to remnant habitats on King Island (TSSC 2022; Webb and Bell 2023). The scrubtit is reliant on mature Melaleuca ericifolia swamp forest. Burning of habitat by wildfires is considered the greatest threat to the species (Donaghey 2011). Nook Swamp is the largest tract of remaining habitat for the subspecies (Newall and Lloyd 2012). The abundance of both birds is estimated to be <50 mature individuals and they are identified in the top three of bird species most likely to go extinct within the next 20 years (Garnett et al. 2011; Webb et al. 2016; Webb and Bell 2023).

The scrambling groundfern is known from poorly drained areas at the scrubby margins of swamp forests (Threatened Species Section 2023a). There are 7 known populations in Tasmania and the population at the site is the only one listed in a State Reserve (Threatened Species Section 2023a).

At the Ramsar Site, swamp fireweed occurs in herb-rich native grassland in a broad swale between stable sand dunes in the Nook swamps. The population at the Site is one of three in Tasmania known in protected areas (Threatened Species Section 2023b).
Nationally threatened ecological community, “Tasmanian forests and woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)” (EPBC – critically endangered) occurs in small pockets at the Site and is a key habitat for the brown thornbill (DEE 2019).

The “King Island scrub complex” ecological community occurs at the Site (currently being considered for listing as a threatened ecological community under the EPBC Act).

☑ Criterion 3 : Biological diversity

Justification

The Site is important for biodiversity at a regional scale, partly due to the mix of habitat and wetland types supported by the Site, but also because the ecological communities on King Island represent a transitional zone between the Australian mainland and north-west Tasmania, supporting species from both the north and south (Barnes et al. 2002).
The diversity of vegetation communities is a significant aspect of the Site. In a bioregional context, this Site is significant because it contains the largest reserved patch of Melaleuca ericifolia swamp forest in Tasmania (Barnes et al. 2002). There are significant vegetation communities associated with seabird rookeries within the Site and a large variety of wetland types at the Site, including: freshwater aquatic wetlands; herbfields and grasslands marginal to wetland; and sedge/rush wetland (Barnes et al. 2002).

Data gaps exist for fauna species abundance at the Site. Existing survey data provides the following indicative figures:
• 17 species of aquatic macroinvertebrates found from a survey of the Sea Elephant River and 22 species found from a survey of Nook Swamp (Donaghey 2003)
• 8 freshwater fish species (PWS 2000)
• No data for marine fish species (Newall and Lloyd 2012)
• 2 regionally rare bird species (Newall and Lloyd 2012)
• 144 bird species including 75 species of waterbirds and seabirds (PWS 2000; Newall and Lloyd 2012)
• 10 migratory bird species (Newall and Lloyd 2012)
• 35 native mammal species including 13 terrestrial and freshwater species (including two bat species) and two marine species (PWS 2000)
• 6 frog species (PWS 2000)
• 9 reptile species including 3 snakes and 6 lizard species (PWS 2000)
• 13 native plant communities (Barnes et al 2002)
• 6 wetland vegetation communities (Newall and Lloyd 2012)
• 6 regionally rare wetland-associated plant species (Newall and Lloyd 2012)

Furthermore, there are nine wetland dependent species listed the Tasmanian State Threatened Species Protection Act 1995 (TSPA) that are supported by the site:
• white-bellied sea eagle, Haliaeetus leucogaster (TSPA - vulnerable);
• eastern curlew, Numenius madagascariensis, (TPSA - endangered);
• little tern, Sternula albifrons sinensis (TSPA - endangered);
• striped marsh frog, Limnodynastes peroni, (TSPA - endangered,): one of 6 species found within the reserve (there are only 11 Tasmanian frog species);
• hairy brooklime, Fonkia uliginosa (TSPA - rare): found in wet herbfields in the Dunes near Nook Swamp;
• fan triggerplant, Stylidium beaugleholei (TSPA - rare): found in damp heath and lagoon margins, e.g., around Lake Martha Lavinia and Sandsheet Ecosystem;
• pink bladderwort, Utricularia tenella (TSPA - rare): found in damp heath and lagoon margins, e.g., around Lake Martha Lavinia and Sandsheet Ecosystem);
• small triggerplant, Stylidium despectum (TSPA - rare): found in wet heath;
• submerged watertuft, Trithuria submersa (TSPA - rare): found in damp heath, Sandsheet Ecosystem.

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

Optional text box to provide further information

The Site (in particular Sea Elephant Estuary) provides critical habitat for the threatened orange-bellied parrot during its annual migration between south-eastern Australia and Tasmania (OBPRT 2006). Orange-bellied parrots have been recorded roosting and loafing in dense clumps of swamp paperbark (Melaleuca ericifolia) and coastal wattle (Acacia sophorae) at the edges of estuaries on King Island (TSSC 2006). Within the Site, their primary feeding grounds and roosting areas are in the Sea Elephant Estuary saltmarsh and surrounds, and Nook Swamp. Nook Swamp is the largest tract of remaining habitat for the threatened King Island scrubtit, which has been observed successfully breeding at the Site on several occasions (KINRMG, 2005).

The extensive beaches support beach nesting shorebirds including fairy tern (Sterna nereis), Australian pied oystercatcher (Haematopus longirostris), and hooded plover (Thinornis rubricollis). Cowper Point is recognised as a priority site for little tern (Sternula albifrons sinensis) (Bryant 2002). The site also supports breeding populations of little penguin (Eudyptula minor) (Donaghey 2003). The Site offers refuge from threats such as disturbance by humans, dogs and vehicles (Newall and Lloyd 2012).

Three rookeries of short-tailed shearwater (Ardenna tenuirostris), a listed migratory species, have been recorded within the reserve (PWS 2000). Short-tailed shearwaters breed in burrows under the grass tussocks of the coastal grasslands. This species breeds in Australia and winters in the Sea of Japan, Bering Sea, Gulf of Alaska and Chukchi Sea (Carey et al., 2014, Yamamoto et al., 2015).

The Site supports 9 migratory birds listed nationally and under international migratory bird agreements (China-Australia Migratory Birds Agreement, Japan-Australia Migratory Birds Agreement, and Korea-Australia Migratory Birds Agreement) (Newall and Lloyd 2012):
• eastern curlew (Numenius madagascariensis)
• short-tailed shearwater (Ardenna tenuirostris)
• ruddy turnstone (Arenaria interpres)
• sharp-tailed sandpiper (Calidris acuminata)
• red-necked stint (Calidris ruficollis)
• white-throated needletail (Hirundapus caudacutus)
• Caspian tern (Hydroprogne caspia)
• little tern (Sterna albifrons)
• greenshank (Tringa nebularia)

The eastern curlew is a threatened and migratory species. It forages on soft sheltered intertidal sandflats or mudflats, in open areas without vegetation or covered with seagrass, near saltmarsh, and on ocean beaches near the tideline (Department of Environment 2015).

The Site provides key habitat for the threatened green and golden frog. This species has habitat requirements that include both permanent waters with still to slow-flowing areas (for breeding) and nearby forests and grasslands (for feeding). The site supports the state listed striped marsh frog (TSPA - endangered). Much of the core range of the Southern Hairy Red Snail (TSPA - vulnerable) is situated within the Lavinia Reserve.

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	*Acacia sophorae*	☐	☑	☐		☐		C3: The species provides roosting and loafing habitat for the critically endangered orange-bellied parrots

Phylum	Scientific name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
TRACHEOPHYTA / LILIOPSIDA	*Caladenia pusilla*	☐	☑	☐		☐	State listed (TSPA) - rare	C3: The species is threatened at the state level and contributes to the biodiversity of the Site.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Elaeocarpus reticulatus*	☐	☑	☐	LC	☐	State listed (TSPA) - rare	C3: The species is threatened at the state level and contributes to the biodiversity of the Site.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Eucalyptus brookeriana*	☐	☑	☐	NT	☐		C3: This species forms part of the nationally listed threatened ecological community. This ecological community provides critical habitat for the King Island brown thornbill.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Fonkia uliginosa*	☐	☑	☐		☐	State listed (TSPA) - rare	C3: The species is threatened at the State level and contributes to the biodiversity of the Site.
TRACHEOPHYTA / POLYPODIOPSIDA	*Hiya distans*	☑	☐	☐		☐	Nationally listed (EPBC) – endangered	C2: Nationally listed threatened species. (Previously listed as Hypolepis distans).
TRACHEOPHYTA / MAGNOLIOPSIDA	*Melaleuca ericifolia*	☐	☑	☐	LC	☐		C3: The endangered King Island scrubtit is reliant on mature Melaleuca ericifolia swamp forest. C3: The species provides roosting and loafing habitat for the critically endangered orange-bellied parrots.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Parietaria debilis*	☐	☑	☐		☐	State listed (TSPA) - rare	C3: The species is threatened at the state level and contributes to the biodiversity of the Site.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Phyllangium distylis*	☐	☑	☐		☐	State listed (TSPA) - rare	C3: The species is threatened at the state level and contributes to the biodiversity of the Site.
TRACHEOPHYTA / LILIOPSIDA	*Pterostylis sanguinea*	☐	☑	☐		☐	State listed (TSPA) - rare	C3: The species is threatened at the state level and contributes to the biodiversity of the Site.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Senecio psilocarpus*	☑	☐	☐		☐	Nationally listed (EPBC) – vulnerable	C2: Nationally listed threatened species.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Stylidium beaugleholei*	☐	☑	☐		☐	State listed (TSPA) - rare	C3: The species is threatened at the state level and contributes to the biodiversity of the Site.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Stylidium despectum*	☐	☑	☐		☐	State listed (TSPA) - rare	C3: The species is threatened at the state level and contributes to the biodiversity of the Site.
TRACHEOPHYTA / LILIOPSIDA	*Thelymitra holmesii*	☐	☑	☐		☐	State listed (TSPA) - rare	C3: The species is threatened at the state level and contributes to the biodiversity of the Site.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Trithuria submersa*	☐	☑	☐		☐	State listed (TSPA) - rare	C3: The species is threatened at the state level and contributes to the biodiversity of the Site.
TRACHEOPHYTA / MAGNOLIOPSIDA	*Utricularia tenella*	☐	☑	☐	LC	☐	State listed (TSPA) - rare	C3: The species is threatened at the state level and contributes to the biodiversity of the Site.

Brooker's gum (Eucalyptus brookeriana) forms part of the EPBC listed threatened ecological community 'Tasmanian Forest dominated by black gum or Brooker's gum' (EPBC - critically endangered). This ecological community provides critical habitat for the King Island brown thornbill (DEE 2019).

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																	
CHORDATA / MAMMALIA	*Antechinus minimus*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		C3: This subspecies (Antechinus minimus minimus) is wetland dependent and is endemic to Tasmania. C4: This species may breed at the Site (knowledge gap).
CHORDATA / MAMMALIA	*Arctocephalus forsteri*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐	State listed (TSPA) – rare Nationally listed (EPBC) – marine	C3: The species is wetland dependent, listed as rare at level and contributes to the biodiversity of the Site.
CHORDATA / AMPHIBIA	*Crinia signifera*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		C3: This species is one of the 6 frog species found at the Site (and on King Island), and one of the 11 found in entire Tasmania.
CHORDATA / AMPHIBIA	*Geocrinia laevis*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		C3: This species is one of the 6 frog species found at the Site (and on King Island), and one of the 11 found in entire Tasmania.
CHORDATA / AMPHIBIA	*Limnodynastes dumerilii*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		C3: This species is one of the 6 frog species found at the Site (and on King Island), and one of the 11 found in entire Tasmania.
CHORDATA / AMPHIBIA	*Limnodynastes peronii*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	State listed (TSPA) - endangered	C3: The species is threatened at the state level and contributes to the biodiversity of the Site. C3: This species is one of the 6 frog species found at the Site (and on King Island), and one of the 11 found in entire Tasmania. C4: The species relies on the Site for breeding and feeding. It is predominantly a pond-dweller, and is likely to use Nook Swamp and the perched lakes within the Dunes Ecosystem.
CHORDATA / AMPHIBIA	*Litoria ewingii*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		C3: This species is one of the 6 frog species found at the Site (and on King Island), and one of the 11 found in entire Tasmania.
CHORDATA / AMPHIBIA	*Litoria raniformis*	☑	☑	☐	☐	☐	☐	☐	☐				EN	☐	☐	Nationally listed (EPBC) - vulnerable	C4: The species relies on the Site for breeding and feeding. This species is dependent on permanent freshwater lagoons for breeding. They require terrestrial habitat for feeding, mainly on terrestrial invertebrates such as beetles, termites, cockroaches, moths, butterflies and various insect larvae.
CHORDATA / MAMMALIA	*Ornithorhynchus anatinus*	☐	☐	☐	☐	☑	☐	☐	☐				NT	☐	☐		C3: The species is wetland dependent and endemic to Australia. C4: This species may breed at the Site (knowledge gap).
CHORDATA / MAMMALIA	*Rattus lutreolus*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		C3: The species is wetland dependent and native to Australia. This may actually be a Tasmanian subspecies: Rattus lutreolus velutinus (knowledge gap). C4: This species may breed at the Site (knowledge gap).

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 / MAMMALIA	*Trichosurus vulpecula*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		C3: This subspecies (Trichosurus vulpecula fuliginosus) is endemic to Tasmania. C4: This species may breed at the Site (knowledge gap).
Fish, Mollusc and Crustacea																	
MOLLUSCA / GASTROPODA	*Chloritobadistes victoriae*	☐	☐	☐	☐	☑	☐	☐	☐					☐	☐	State listed (TSPA) - vulnerable	C3: The species (Austrochloritis victoriae) is listed as threatened at the state level and contributes to the biodiversity of the Site. It was previously thought to be extinct. Within Tasmania, this species only occurs on the north eastern coast of King Island. This species is found amongst fallen logs, feeding on rotting wood and leaf litter.
CHORDATA / ACTINOPTERYGII	*Galaxias brevipinnis*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		C3: The species is water dependent and only 1 of 6 freshwater fish fauna species found on King Island.
Birds																	
CHORDATA / AVES	*Acanthiza pusilla archibaldi*	☑	☐	☐	☐	☑	☐	☐	☐					☐	☐	Nationally listed (EPBC) – endangered	C3: The species is an island endemic subspecies.
CHORDATA / AVES	*Acanthornis magna greeniana*	☑	☑	☐	☐	☑	☐	☐	☐					☐	☐	Nationally listed (EPBC) – critically endangered	C3: The species is an island endemic subspecies. C4: The species uses the Site for breeding.
CHORDATA / AVES	*Arenaria interpres*	☑	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC) – vulnerable, marine and migratory**	C3: Identified in Ecological Character Description as a critical component of site (migratory birds), it is characteristic or typical of region. C4: This species uses the Site for non-breeding habitat and as a stopover point during migration*.
CHORDATA / AVES	*Bubulcus ibis*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC) – marine	C3: Identified in Ecological Character Description as a critical component of site (migratory birds), it is characteristic or typical of region. C4: This species migrates within Australia and uses the Site for foraging and roosting. It may breed at the Site (knowledge gap).
CHORDATA / AVES	*Calidris acuminata*	☑	☑	☐	☐	☑	☐	☐	☐				VU	☐	☐	Nationally listed (EPBC) – vulnerable, marine and migratory	C3: Identified in Ecological Character Description as a critical component of site (migratory birds), it is characteristic or typical of region. C4: The species uses the Site for non-breeding habitat and as a stopover point during migration.
CHORDATA / AVES	*Calidris ruficollis*	☐	☑	☐	☐	☑	☐	☐	☐				NT	☐	☐	Nationally listed (EPBC) – marine and migratory	C3: Identified in Ecological Character Description as a critical component of site (migratory birds), it is characteristic or typical of region. C4: The species uses the Site for non-breeding habitat and as a stopover point during migration.
CHORDATA / AVES	*Eudyptula minor*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC) – marine	C3: Identified in Ecological Character Description as a critical component of site (nesting waterbirds and seabirds), it requires special habitat or environmental condition found at the Site. C4: The species uses the Site for breeding. It often nests in the vegetated areas of the foredunes.
CHORDATA / AVES	*Haematopus longirostris*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐		C3: Identified in Ecological Character Description as a critical component of site (nesting waterbirds and seabirds), it requires special habitat or environmental condition found at the Site. C4: This shorebird species uses the Site for beach nesting.
CHORDATA / AVES	*Haliaeetus leucogaster*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	State listed (TSPA) - vulnerable	C3: The species is threatened at the state level and contributes to the biodiversity of the Site. C4: The site provides prey species and habitat for hunting (e.g., fishing waters in the estuary). The site may provide breeding habitat (knowledge gap).

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	*Hirundapus caudacutus*	☑	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC) – vulnerable, marine and migratory	C3: Identified in Ecological Character Description as a critical component of site (migratory birds), it is characteristic or typical of region. C4: The species uses the Site for non-breeding habitat and as a stopover point during migration.
CHORDATA / AVES	*Hydroprogne caspia*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC) –marine and migratory	C3: Identified in Ecological Character Description as a critical component of site (migratory birds), it is characteristic or typical of region. C4: Whilst listed as a migratory species, in Australia this species is typically a resident and only migrates locally. Breeding is likely to occur at the site (knowledge gap). Breeding is likely to occur at the site (knowledge gap).
CHORDATA / AVES	*Neophema chrysogaster*	☑	☑	☐	☐	☐	☐	☐	☐				CR	☑	☐	Nationally listed (EPBC) – critically endangered	C4: The species relies on the Site for feeding, loafing, roosting and migration.
CHORDATA / AVES	*Numenius madagascariensis*	☑	☑	☐	☐	☑	☐	☐	☐				EN	☐	☑	Nationally listed (EPBC) – critically endangered, migratory and marine State listed (TSPA) - endangered	C3: The species is also threatened at the state level and contributes to the biodiversity of the Site. C4: This species uses the site for non-breeding habitat and as a stopover point during migration. The species uses the site (particularly around Sea Elephant Estuary) for foraging and roosting.
CHORDATA / AVES	*Puffinus tenuirostris*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC) – marine and migratory	C3: Identified in Ecological Character Description as a critical component of site (nesting waterbirds and seabirds), it requires special habitat or environmental condition found at the Site. C4: The species is migratory and uses the Site for breeding. It nests in rookeries at Cowper Point, Lavinia Point and just south of Nook Swamp. This species breeds in Australia and overwinters in the northern hemisphere (around the Bering Sea).
CHORDATA / AVES	*Sternula albifrons sinensis*	☐	☑	☐	☐	☑	☐	☐	☐					☐	☐	State listed (TSPA) - endangered	C3: The species is threatened at the State level and contributes to the biodiversity of the Site. C4: This shorebird species uses the Site for beach nesting. Cowper Point is a priority Site for this species.
CHORDATA / AVES	*Sternula nereis nereis*	☑	☑	☐	☐	☑	☐	☐	☐				VU	☐	☐	Nationally listed (EPBC) – vulnerable	C3: Identified in Ecological Character Description as a critical component of site (nesting waterbirds and seabirds), it requires special habitat or environmental condition found at the Site. C4: This shorebird species uses the Site for breeding and beach nesting.
CHORDATA / AVES	*Thinornis rubricollis*	☑	☑	☐	☐	☑	☐	☐	☐				VU	☐	☐		C3: Identified in Ecological Character Description as a critical component of site (nesting waterbirds and seabirds), it requires special habitat or environmental condition found at the Site. C4: This shorebird species uses the Site for beach nesting.
CHORDATA / AVES	*Tringa nebularia*	☑	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC) – endangered, marine and migratory CAMBA, JAMBA, and ROKAMBA listed***	C3: Identified in Ecological Character Description as a critical component of site (migratory birds), it is characteristic or typical of region. C4: The species uses the Site for non-breeding habitat and as a stopover point during migration.

1) Percentage of the total biogeographic population at the site

A comprehensive fauna survey has not been undertaken for the Ramsar Site. Broader surveys of King Island have recorded over 170 bird, 20 mammal, 9 reptile species (including three snakes and six lizard species) and 170 invertebrate species (PWS 2000).

Twenty-four macroinvertebrate species were collected at Sea Elephant Estuary during surveys in the late 1990s (Edgar et al 1999). Of these, eight were crustaceans, four were gastropods, four were bivalves, three were polychaetes and five were classified as “other”. A report prepared by Donaghey (2003) listed 17 species of aquatic macroinvertebrates found from a survey of the Sea Elephant River and 22 species found from a survey of Nook Swamp (Donaghey 2003). The coastal (intertidal) elements of the Site are likely to include invertebrates such as insects, annelids, crustacea, molluscs and gastropods, as these are the prey species of shorebirds that use the beach habitat.

The diversity and abundance of fauna species within the Ramsar Site is currently a knowledge gap.

Notes:
* Most migratory bird species within Australia follow the East Asian-Australasian Flyway (EAAF), migrating seasonally between breeding habitat in the northern hemisphere, and non-breeding habitat within Australia. See: https://www.eaaflyway.net/the-flyway

** In Australia, migratory species are recognised under the EPBC Act. This is based on listings under the Convention on Migratory Species and bilateral migratory bird agreements between Australia, China, Japan and Korea. See: https://www.dcceew.gov.au/environment/biodiversity/migratory-species/migratory-birds

*** CAMBA: China-Australian migratory bird agreement; JAMBA: Japan-Australia migratory bird agreement; ROKAMA: Republic of Korea-Australia migratory bird agreement.

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
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	☑	This type of eucalypt forest to woodland is restricted to Tasmania and is associated with sites that are typically damp and/or poorly draining. See: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/77-conservation-advice.pdf	Nationally listed (EPBC) – critically endangered
Subtropical Temperate Coastal Saltmarsh	☑	This community consists of organisms including and associated with saltmarsh in coastal regions of sub-tropical and temperate Australia.See: https://www.environment.gov.au/biodiversity/threatened/communities/pubs/118-conservation-advice.pdf	Nationally listed (EPBC) – vulnerable

Optional text box to provide further information

Whilst not listed nationally as threatened, the following wetland vegetation communities form part of the critical components and processes of the Ramsar Site:

• Melaleuca ericifolia swamp forest: typically found on heavier, poorly drained soils. This community is dominated by swamp paperbark (Melaleuca ericifolia), with stands up to 30 m tall, forming a closed forest canopy. Scented paperbark (Melaleuca squarrosa) is associated with this community in the wetter areas while manuka (Leptospermum scoparium) is associated with the community on the drier areas of the Site. This vegetation community provides vital habitat for the King Island scrubtit. The location of the swamp forest within the Lavinia State Reserve (predominantly Nook Swamp), makes it vulnerable to wildfire fanned by westerly and north-westerly winds.

• Graminoid saltmarsh (saline sedgeland/rushland): note that this vegetation community forms part of the EPBC Act listed 'Subtropical and Temperate Coastal Saltmarsh'. Within the Ramsar Site, saltmarsh is restricted to the estuaries of the Sea Elephant River. This community is dominated by sea rush (Juncus kraussii) with an intertussock flora of beaded glasswort (Sarcocornia quinqueflora), and halophytic herbs/sedges, such as creeping brookweed (Samolus repens), swampweed (Selliera radicans) and Shiny bog-sedge (Schoenus nitens).

• Succulent saltmarsh: note that this vegetation community forms part of the EPBC Act listed 'Subtropical and Temperate Coastal Saltmarsh'. It is found near the mouths of estuaries and inlets, where the inundation occurs more frequently, and the water is more saline. The most common succulent herb is beaded glasswort (Sarcocornia quinqueflora), which occupies the most saline and moist frequently inundated areas. shrubby glasswort (Tecticornia arbuscula) heath occurs in slightly less saline and less waterlogged areas and in Sea Elephant Estuary it forms a narrow strip which fringes the lower reaches of the eastern shoreline.

• Lacustrine herbland: occurs as a thin fringe around wetlands where the water level fluctuates. It is found around Pennys Lagoon and on the western edge of Lake Martha. This vegetation community provides ideal habitat for the green and gold frog and the striped marsh frog. It provides the sedge/ grasslands necessary for hunting, in close proximity to permanent still to slow flowing water required for breeding.

• Freshwater aquatic sedgeland and rushland: occurs as localised patches around large lagoons. Within the Ramsar Site, sedge/rushland is found along the edges of Pennys Lagoon and Lake Martha Lavinia. It develops on soils that are frequently (or permanently) inundated with water ranging from fresh to saline and is typically dominated by sedges and rushes of the genera Juncus, Baumea, Carex, Eleocharis, and Lepidosperma, with very few shrubs or herbs. This community provides the sedge habitat necessary for hunting, and near permanent still to slow flowing water required for breeding.

• Short paperbark swamp: is dominated by a dense layer of scented paperbark (Melaleuca squarrosa) and manuka (Leptospermum scoparium), to a height range of 2 to 8m. Short paperbark swamps have high conservation value as they are relatively rare on King Island and have high biodiversity value, especially when they are part of a continuous vegetation mosaic, as is the case in the Lavinia Reserve. (Newall and Lloyd 2012).

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

4.1 - Ecological character

The critical components and processes of the Site are:
• Wetland vegetation communities: support rare floral species and provide habitat for rare, threatened and migratory faunal species. These communities contribute to the unique character of the Site and could easily change through human disturbance, changes to the fire regime, or climate change.

• Nationally and/or regionally threatened or rare plant species.

• Nationally and/or regionally threatened or rare bird species, including:
- orange-bellied parrot: primarily feeds and roosts within the salt marshes within and surrounding the estuary. Also uses dense clumps of swamp paperbark such as around Nook Swamp.
- King Island scrubtit: core critical habitat is the tall mature swamp paperbark forest in Nook Swamp. Diet is unknown, but expected to consist of insects, spiders, and snails.
- eastern curlew: feeds in sheltered shallows of the estuary and occasionally open beaches of the coastal strip; roosts on sheltered beaches and salt marshes around the estuary.
- white-bellied sea eagle: hunts over open waters of the estuary and the coastal strip; roosts and breeds in taller trees around Nook Swamp.

• Waterbirds and seabirds (including migratory birds): of the 144 bird species recorded at the site, 75 species are waterbirds or seabirds. 6 species breed at the site: hooded plover, little tern, fairy tern, Australian pied oystercatcher, short-tailed shearwater, and little penguin. 8 migratory species use the site: ruddy turnstone, sharp-tailed sandpiper, red-necked stint, white-throated needletail, Caspian tern, greenshank, short-tailed shearwater and little tern.

• Frogs:
-striped marsh frog: predominantly a pond-dweller, but able to adapt to a range of water habitats. Within the Site it is likely to occur at Nook Swamp and the perched lakes within the dunes.
-green and gold frog: dependent on permanent freshwater lagoons for breeding. Requires terrestrial habitat (e.g. grasslands and forest) for feeding, mainly on invertebrates such as beetles, termites, cockroaches, moths, butterflies and insect larvae.

The essential elements of the Site, that support the critical components and processes, are:

• Climate: mild temperatures with relatively high rainfall, combined with wind direction (strong south-westerly component) and speed (typically 20 to 25 km/hr in all seasons), influence the Site.

• Geomorphology: sandy deposits dominate the Site, and have formed dunes, dune barrage lagoons and inland sand sheets.

• Hydrology: the local groundwater systems within the unconsolidated sands controls much of the hydrology of the Site. The local perched groundwater systems within the coastal dunes influence the hydrology of the small, perched lagoons and are independent of the regional groundwater system.

• Terrestrial vegetation: provides the overall structure of the ecosystems within the Ramsar Site, supporting habitat for wetland communities.

• Fire regime: frequency of occurrence, intensity, patchiness, and time elapsed between fires will all influence the character of the Site. Areas of peat around Nook Swamp are particularly sensitive to fire.

• Water quality: whilst water quality of the Site is unknown, nutrient and sediment inputs from upstream land use and historic land clearing are likely to affect the Site.

• Fish and macroinvertebrates: form an important food source for other species that use the wetland. 6 freshwater native species and 1 introduced species occur at the Site. 170 invertebrates have been recorded for King island (including the surrounding waters), over 140 of which are freshwater species.

(Newall and Lloyd 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
D: Rocky marine shores		0		
E: Sand, shingle or pebble shores	Sandy beaches of the Coastal Strip	0		
F: Estuarine waters	Sea Elephant Estuary	4	76.5	
G: Intertidal mud, sand or salt flats	Sea Elephant Estuary	0		
H: Intertidal marshes	The saltmarsh vegetation of the Sea Elephant Estuary	0	63.1	Representative
J: Coastal brackish / saline lagoons	Sea Elephant Estuary	0		
K: Coastal freshwater lagoons	Pennys Lagoon, Lake Martha Lavinia	0	42.2	Unique

Inland wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
Fresh water > Flowing water >> M: Permanent rivers/ streams/ creeks	Sea Elephant River	0	9.5	
Fresh water > Lakes and pools >> O: Permanent freshwater lakes	Pennys Lagoon, Lake Martha Lavinia	0	42.2	
Fresh water > Lakes and pools >> Tp: Permanent freshwater marshes/ pools	Pools and marshes in the dunes and interdunes, around and north of the Nook Swamp	0	61.2	Rare
Fresh water > Marshes on inorganic soils >> Ts: Seasonal/ intermittent freshwater marshes/ pools on inorganic soils	Fresh pools and marshes in the dunes and interdunes, around and north of the Nook Swamp	1	1291.2	Rare
Fresh water > Marshes on peat soils >> U: Permanent Non-forested peatlands	Wet heath and Wet scrub, on sandsheet and Nook Swamp	0		
Fresh water > Marshes on inorganic soils >> W: Shrub-dominated wetlands	Wet heath and Wet scrub, Short paperbark swamp on sandsheet and Nook Swamp	2	427.1	
Fresh water > Marshes on inorganic soils >> Xf: Freshwater, tree-dominated wetlands	Nook Swamp	0	19.3	Rare
Fresh water > Marshes on peat soils >> Xp: Permanent Forested peatlands	Nook Swamp	3	222.8	Rare

(ECD) Habitat connectivity	There is connectivity between the terrestrial and marine ecosystems, and the ecosystem units are not independent of each other, having elements that overlap in time and space. E.g., the two permanent freshwater lakes are also coastal freshwater lagoons.

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Phylum	Scientific name	Position in range / endemism / other
TRACHEOPHYTA/LILIOPSIDA	*Baloskion tetraphyllum*	Forms part of the short paperbark swamp vegetation community.
TRACHEOPHYTA/LILIOPSIDA	*Empodisma minus*	Forms part of the short paperbark swamp vegetation community.
TRACHEOPHYTA/LILIOPSIDA	*Gahnia grandis*	Forms part of the short paperbark swamp vegetation community.
TRACHEOPHYTA/MAGNOLIOPSIDA	*Hydrocotyle muscosa*	Forms part of the lacustrine herbland vegetation community.
TRACHEOPHYTA/LILIOPSIDA	*Juncus kraussii*	Forms part of the graminoid saltmarsh vegetation community.
TRACHEOPHYTA/MAGNOLIOPSIDA	*Leptospermum scoparium*	Forms part of the Melaleuca ericifolia swamp forest and short paperbark swamp vegetation communities.
TRACHEOPHYTA/MAGNOLIOPSIDA	*Lobelia alata*	Forms part of the lacustrine herbland vegetation community.
TRACHEOPHYTA/MAGNOLIOPSIDA	*Melaleuca squarrosa*	Forms part of the Melaleuca ericifolia swamp forest and short paperbark swamp vegetation communities.
TRACHEOPHYTA/MAGNOLIOPSIDA	*Salicornia quinqueflora*	Forms part of the graminoid saltmarsh and succulent saltmarsh vegetation communities.
TRACHEOPHYTA/MAGNOLIOPSIDA	*Samolus repens*	Forms part of the graminoid saltmarsh and lacustrine herbland vegetation communities.
TRACHEOPHYTA/LILIOPSIDA	*Schoenus nitens*	Forms part of the graminoid saltmarsh vegetation community
TRACHEOPHYTA/MAGNOLIOPSIDA	*Selliera radicans*	Forms part of the graminoid saltmarsh and lacustrine herbland vegetation communities.
TRACHEOPHYTA/MAGNOLIOPSIDA	*Tecticornia arbuscula*	Forms part of the succulent saltmarsh vegetation community.

Invasive alien plant species

Phylum	Scientific name	Impacts	Changes at RIS update
TRACHEOPHYTA/LILIOPSIDA	*Asparagus scandens*	Actual (minor impacts)	unknown
TRACHEOPHYTA/MAGNOLIOPSIDA	*Cirsium vulgare*	Actual (minor impacts)	unknown
TRACHEOPHYTA/MAGNOLIOPSIDA	*Euphorbia paralias*	Actual (minor impacts)	unknown
TRACHEOPHYTA/MAGNOLIOPSIDA	*Jacobaea vulgaris vulgaris*	Actual (minor impacts)	unknown
TRACHEOPHYTA/MAGNOLIOPSIDA	*Marrubium vulgare*	Actual (minor impacts)	unknown

Optional text box to provide further information

Noteworthy flora:
The Site includes several wetland vegetation communities, as outlined in sections 3.4 and 4.1. the key species that occur in these vegetation communities are listed above.
A number of species are listed under the Tasmanian (state) threatened species legislation (Threatened Species Protection Act 1995). Further information on state-listed threatened species can be found at: https://www.threatenedspecieslink.tas.gov.au/.

Invasive species:
There are 6 weeds of national significance on King Island, and 21 that are listed as declared weeds in Tasmania.
Weeds that pose a threat to the Site include:
• bulrush (Typha spp.) - invaded the Nook Swamp following the 2007 fires (Corbett 2010a and b)
• horehound (Marrubium vulgare) - at the northern end of the reserve on the Nook track
• thistles (Carduus sp. and Cirsium vulgare) – in the Nook Swamp area
• ragwort (Senecio jacobaea) - at the northern end of the reserve on the Nook track
• sea spurge (Euphorbia paralias) - has established along all beaches within the reserve. Areas of high conservation value, including the Lavinia reserve have been identified in the top priorities for sea spurge management and control activities (KINRMG 2010).
• asparagus fern (Asparagus scandens)
• several pasture species.

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/MAMMALIA	*Cercartetus nanus nanus*				The species contributes to the biodiversity of the site, but is not wetland dependent.
CHORDATA/MAMMALIA	*Chalinolobus gouldii*				The species contributes to the biodiversity of the site, but is not wetland dependent.
CHORDATA/MAMMALIA	*Macropus rufogriseus*				The species contributes to the biodiversity of the site, but is not wetland dependent.
CHORDATA/MAMMALIA	*Nyctophilus geoffroyi*				The species contributes to the biodiversity of the site, but is not wetland dependent.
CHORDATA/MAMMALIA	*Potorous tridactylus*				The species contributes to the biodiversity of the site, but is not wetland dependent.
CHORDATA/MAMMALIA	*Pseudocheirus peregrinus*				The Tasmanian subspecies (Pseudocheirus peregrinus viverrinus) contributes to the biodiversity of the site, but is not wetland dependent.
CHORDATA/MAMMALIA	*Tachyglossus aculeatus setosus*				This subspecies is endemic to Tasmania. It contributes to the biodiversity of the site, but may not be wetland dependent.
CHORDATA/MAMMALIA	*Thylogale billardierii*				The species contributes to the biodiversity of the site, but is not wetland dependent.
CHORDATA/ACTINOPTERYGII	*Galaxias maculatus*				This species contributes to the overall biodiversity of the site, but is not considered threatened at the state or national level.
CHORDATA/ACTINOPTERYGII	*Nannoperca australis*				This species contributes to the overall biodiversity of the site, but is not considered threatened at the state or national level.
CHORDATA/ACTINOPTERYGII	*Retropinna tasmanica*				This species contributes to the overall biodiversity of the site, but is not considered threatened at the state or national level.

Invasive alien animal species

Phylum	Scientific name	Impacts	Changes at RIS update
CHORDATA/MAMMALIA	*Felis catus*	Potential	unknown

Optional text box to provide further information

Other noteworthy fauna:
Several species occur at the Site and contribute to its biodiversity, but are not considered wetland dependent. These include common species, Tasmanian subspecies, and one endemic species.

Seven native freshwater fish species occur at the Site, none of which are considered threatened. All of the native species occur in the Sea Elephant River (PWS 2000). These are:
• short-finned eel (Anguila australis)
• spotted galaxias (Galaxias truttaceous)
• jollytail (Galaxias maculatus)
• climbing galaxias (Galaxias brevipinnis)
• Tasmanian smelt (Retropinna tasmanica)
• freshwater flathead (Pseudophritis urvillii)
• southern pygmy perch (Nannoperca australis)
The first six species listed above spawn in marine or estuarine zones, and the juveniles of these species disperse widely in estuaries and/or local coastal waters prior to re-entering freshwater (Donaghey 2003). Although the southern pygmy perch is regarded as a freshwater species, it has a high tolerance to salt.

Invasive species:
Feral cats are noted in several reports as posing a threat to the native wildlife, including the orange-bellied parrot, other bird species and small reptiles and mammals (e.g., Donaghey 2003; OBPRT 1999; PWS 2000;). However, there is no site-specific data regarding feral cat impacts. PWS (2000) notes that feral cats have been observed throughout the Lavinia Nature Reserve and that they are considered a major threat to the orange-bellied parrot because the birds' habit of feeding on low saltmarsh makes them susceptible to predation.
Feral cats were trapped around a feeding Site for the orange-bellied parrot during autumn and winter from 1992 to 1995 (OBPRT 1999). After the closure of the Naracoopa rubbish tip in 1995, cat numbers were reported to drop dramatically in the area. There appears to be an awareness of the feral cat threat to the parrots, with OBPRT (1999) noting that a mining proposal included a 'no cats on site' policy, securing all refuse and conducting cat trapping throughout the course of the proposed mining operations

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)

King Island has a maritime climate influenced by the exposure to the Southern Ocean and the mid-latitude westerly circulation. Temperatures are generally cool to moderate with a narrow seasonal cycle. Average daily maximum temperatures are around 21°C in February, and 13.2°C in July. Average annual rainfall is less than 1000 mm with a very distinct winter peak (ACE CRC, undated)

According to BoM and CSIRO (2020) climate change projections for Australia's NRM Regions (Southern Australia: Southern Slopes), average temperatures will continue to increase in all seasons with more hot days and warm spells projected, with fewer frosts. Less rainfall in the cool season is projected, but with strong regional differences. Increased intensity of extreme rainfall events is projected. Mean sea level will continue to rise and increased height of extreme sea-level events. A harsher fire-weather climate is likely in the future.

4.4.2 - Geomorphic setting

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

a) Maximum elevation above sea level (in metres): 80

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.

The Site lies on the coastline, extending into the intertidal zone of the Bass Strait.
Within the Site, the main surface flows dependent on this type of system are the lower end of the Sea Elephant River and its northern tributaries through Saltwater Creek and Nook Swamp.

4.4.3 - Soil

Organic ☑

(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)

Sandy deposits dominate the Site, which primarily consist of Quaternary sediments and emerged marine surfaces that have formed dune systems, dune barrage lagoons and inland sand sheets. Landforms of the site are largely the result of several distinct episodes of coastal dune formation and time with two key phases - the first during the late Pleistocene, creating the Old Dune system and the second during the Holocene creating the New Dune system. The coastal strip of the area is based on Quaternary coastal calcareous sands, forming sand dunes and beaches. Further inland are Quaternary sand plains with mostly deep organic sandy soils. Nook Swamps and the surrounding wetlands contain extensive peatlands developed in two contexts. Firstly, fibrous peats of up to one metre in depth are found associated with Melaleuca forests and likely to be many thousands of years old. Secondly, shallower humic peats have developed in surrounding wetlands in depressions on the plains.

4.4.4 - Water regime

Water permanence

Presence?	Changes at RIS update
Usually permanent water present	unknown
Usually seasonal, ephemeral or intermittent water present	unknown

Source of water that maintains character of the site

Presence?	Predominant water source	Changes at RIS update
Water inputs from groundwater	☑	No change
Water inputs from surface water	☐	No change

Water destination

Presence?	Changes at RIS update
Feeds groundwater	No change
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:

Groundwater
The major groundwater systems influencing the Site fall into two general types:
• local groundwater systems within unconsolidated sands, present in the sedimentary basin (the 'depressed interior' described by Jennings 1959): this groundwater system controls the hydrology of much of the Site. The main source of this groundwater is rain falling on impermeable granite outcrops to the west of the Site and running through the unconsolidated sands of the basin (Houshold pers. comm. 2005). Wetlands, soaks, peatlands and some streams are formed where the land surface intersects with these groundwater systems.

• local perched groundwater systems occurring within the coastal dunes (Dyson undated): perched water tables have led to many smaller lagoons with independent hydrological systems. Being independent of regional groundwater systems these small wetlands are vulnerable to mechanical activity which may disrupt the organic 'plugs', allowing increased seepage rates (Houshold pers. comm. 2005).

Surface water
Groundwater flows are augmented by direct infiltration of rainfall on the sandy (and hence porous) catchment, providing water to the Site in the form of surface flows (streams) and through the groundwater. Within the Site, the main surface flows dependent on this type of system are the lower end of the Sea Elephant River and its northern tributaries through Saltwater Creek and the Nook Swamp (DPIPWE 2014).

The marine/coastal wetland types have fluctuating (intertidal) water levels. During times of low water level in the estuarine lagoon, some of the area becomes intertidal mud or sand flat.

The hydrology of the Site is not well understood. Knowledge gaps include:
• flows into and through Nook Swamp.
• water levels in the major wetlands (Pennys Lagoon and Lake Martha-Lavinia).
• discharge data from Sea Elephant River into the estuary, including variability.
• groundwater dynamics.

(ECD) Connectivity of surface waters and of groundwater	Much of the Lavinia Ramsar Site is groundwater dependent. The main source of groundwater recharge occurs via infiltration of rainfall on impermeable granite outcrops to the west of the site and running through the unconsolidated sands of the basin.
(ECD) Stratification and mixing regime	Artificial drains have been constructed upstream of Nook Swamp, directing the water from Egg Lagoon towards the Nook Swamp, causing the delivery of high pulses of nutrients and sediments during storm events (Jordan 1975).

4.4.5 - Sediment regime

Significant erosion 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):

Sandy deposits dominate the Site (PWS 2000), mostly consisting of Quaternary sediments and emerged marine surfaces that have subsequently formed dune systems, dune barrage lagoons and inland sandsheets (Orr 2003). Inland sandsheets consist largely of aeolian sediments (Lloyd 2003). These sandsheets form gently undulating surfaces of low dunes, peatlands and swamps, with a sandy duplex soil that is highly susceptible to waterlogging (Rando 1987). Due to the low relief, surface water has little capacity to erode or even form channels in this area (Jerie et al. 2000).
Artificial drains at Egg Lagoon have altered the flow regime and quality of the water delivered to Nook Swamp. During rainfall events, drainage lines deliver water more rapidly to receiving stream channels, leading to faster and deeper floods with associated erosion. This process leads to the drains delivering artificially high pulses of nutrients and sediments to the wetlands in Nook Swamp.

(ECD) Water turbidity and colour: No samples available at Site, but 5km upstream samples show turbidity levels 3-98 NTU (Baker 2006).

(ECD) Light - reaching wetland: No information available

(ECD) Water temperature: No samples available at Site, but 5km upstream samples show water temperature levels 7.6-19.6°C (Baker 2006).

4.4.6 - Water pH

Acid (pH<5.5) ☐

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

Circumneutral (pH: 5.5-7.4) ☐

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

Alkaline (pH>7.4) ☐

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

Unknown ☑

Please provide further information on pH (optional):

No samples available at Site, but 5km upstream samples show slightly acidic water pH levels 5.3-7.2 (Baker 2006).

4.4.7 - Water salinity

Fresh (<0.5 g/l) ☑

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

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):

Water salinity varies across the Site, although sampled values are not available. Pennys Lagoon and Lake Martha Lavinia are type O permanent freshwater lakes/ type K coastal freshwater lagoons, while Nook Swamp is type Xf freshwater, tree-dominated wetlands and the pools and marshes in the dunes and interdunes around the north of the Nook Swamp are type Tp and Ts freshwater wetlands. The water of Sea Elephant Estuary is brackish to saline and therefore the areas allocated to wetland type F (estuarine waters) at the Site could also be classed as wetland type J (coastal brackish). However, it has been classified by Edgar et al. (1999) as a 'barred, low salinity estuary'.

During low flows the waters in contributing waterways are likely to have increased salinity due to greater groundwater influences, stressing the biota of the system. Increased salinity through past land clearance poses a likely threat to the vegetation communities of this ecosystem.

(ECD) Dissolved gases in water

No samples available at Site, but 5km upstream samples show low dissolved oxygen levels of 0.1-8.3mg/litre (Baker 2006). The causes of these have been identified as poor riparian vegetation and unlimited stock access to the stream channel (Bobbi 1999) and works have commenced to ameliorate these impacts (Baker 2006).

4.4.8 - Dissolved or suspended nutrients in water

Eutrophic ☑

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

Unknown ☐

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

Although there are no studies on nutrient cycling of the estuary, it is likely that this process occurs, providing carbon, nitrogen, and phosphorus for biota. Contributions of nutrients to the estuary from further up the catchment may overload the system and turn it eutrophic. During high flow events, high pulses of nutrients are delivered to Nook Swamp. The elevated nutrients can lead to eutrophication of the waters, creating excessive algal growth and associated stresses to the aquatic biota. Land use on cleared private land in the catchment upstream of the Site can exacerbate the eutrophication with fertiliser use. Any runoff from these areas flows into the Site (PWS 2000). The aquaculture oyster farm in Sea Elephant Estuary may threaten the Site through increased nutrient input.
While there are no site samples available, samples taken 5km upstream show high nutrient levels with total Phosphorus 0.036-0.328mg/litre and total Nitrogen 0.79-2.2mg/litre (Baker 2006).

(ECD) Dissolved organic carbon	No information available.
(ECD) Redox potential of water and sediments	No information available.
(ECD) Water conductivity	No samples available at Site, but 5km upstream samples show conductivity levels 420-900 µS/cm (Baker 2006).

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:

Most of the surrounding land is private freehold and Conservation Areas with Councillor Island to the east of Cowper Point proclaimed as a Nature Reserve in 2008. Since the Ramsar Site was listed, two private land titles (one of them abutting the State reserve on the west side of Nook Swamp at Sea Elephant River) have perpetual conservation covenants in place (Title references are 208063/1 and 121914/1).
The private freehold surrounding area supports livestock grazing, mineral exploitation and mining, which are all threats to the Site (Newall and Lloyd 2012). Mining of mineral sand near the township of Naracoopa is a potential threat to the geomorphology of the Site and could cause disturbance in the area, (PWS 2000; Newall and Lloyd 2012). Land clearing, altering drainage, stock grazing, irrigation and other activities on the nearby agricultural land have the potential to impact the Site through altered flow regimes and water quality flowing into the Site (such as occurs with flows from Egg Lagoon to the Nook Swamp), including runoff of fertilisers, herbicides and chemicals (Newall and Lloyd 2012).
Offshore gas and petroleum activities have the potential to impact environments that are a significant distance from the location of the activities. For example, though spills, chemical pollution/ contaminants, oil pollution, nutrient pollution, marine debris, and noise pollution. These could potentially impact the ecological character of Lavinia Ramsar site. Windfarms, including offshore windfarms, have the potential to impact species dependent on the wetland, in particular migratory species.

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
Fresh water	Water for industry	Low

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Picnics, outings, touring	Low
Recreation and tourism	Water sports and activities	Low
Recreation and tourism	Recreational hunting and fishing	Low
Recreation and tourism	Nature observation and nature-based tourism	Low
Spiritual and inspirational	Cultural heritage (historical and archaeological)	Medium
Scientific and educational	Educational activities and opportunities	Medium
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	Medium
Scientific and educational	Major scientific study site	Medium

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganizms, the genes they contain, and the ecosystems of which they form a part	High

Optional text box to provide further information

The ecosystem services that support the critical components and processes of the site include:
• Maintenance of landforms (and land forming dynamics) that provide the base for:
• the estuary ecosystem and saltmarshes,
• Nook Swamp, and
• surrounding wetland mosaics (including extensive peatlands, coastal lagoons and perched lakes).
• Provision of freshwater for:
• estuarine ecosystem requirements (including saltmarshes), and
• maintenance of the wetland mosaic within the dunes and sandsheet systems.
• Provision of occasional influx of marine waters for saltmarsh ecosystems.
• Provision of habitat and water regimes to support:
• rare, regionally and nationally important species,
• nationally and internationally listed species,
• breeding species, and
• migratory species.

Benefits to humans derived from the site include:
• provision of water for aquaculture;
• provision of water supply for firefighting (water from the Sea Elephant Estuary can be taken for use in firefighting, specifically for use if the saltmarsh of the estuary is burning);
• tourism/recreation (land-based and water-based including boating, fishing, bird watching, surfing, camping and off-road vehicle use);
• educational and scientific values (the site has been the subject of several biological, ecological, and geomorphic studies and is likely to be again. Study examples include on orange-bellied parrots, saltmarsh ecology, shorebirds, dune geomorphology, dune vegetation ecology); and
• cultural heritage (Indigenous and European) (there is a possible archaeological site connected with colonial whaling and sealing operations at the southern end of the site).
Source: (Newall and Lloyd 2012).

Other ecosystem service(s) not included above:

• Nutrient cycling: the site may be important for nutrient cycling and carbon sequestration, but these are knowledge gaps.
• The site has inspirational, aesthetic and existence values that may be important at the regional, state and national levels.

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):

It is likely that an economic valuation was completed for the aquaculture operation (oyster farm) operating within the Sea Elephant Estuary, but this information is not available.

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 in the mudflats is likely key to the provision of food sources for migratory shorebirds. This is a knowledge gap.
(ECD) Nutrient cycling	It is likely that nutrient cycling occurs in the estuary, providing carbon, nitrogen and phosphorus for the biota of the system.
(ECD) Carbon cycling	Saltmarsh is a long-term carbon sink (blue carbon ecosystem). Carbon is also stored in the terrestrial peatlands of the swamp forests and wetlands. There is no information about the carbon cycling at the site. This is a knowledge gap.
(ECD) Animal reproductive productivity	The Site is important for breeding for several frog and bird species.
(ECD) Vegetational productivity, pollination, regeneration processes, succession, role of fire, etc.	The diversity of the vegetation communities is significant aspect of the site (Barnes et al 2002). Fire regime is a major determinant of the community composition, regeneration and succession.
(ECD) Notable species interactions, including grazing, predation, competition, diseases and pathogens	It is likely that the abundance and diversity of mudflat macroinvertebrates forms a critical food source for migratory/resident shorebirds. This is a knowledge gap.
(ECD) Notable aspects concerning animal and plant dispersal	Six native freshwater fish species at the site spawn in marine/estuarine zones and juveniles of the species disperse widely in estuaries and/or local coastal waters prior to re-entering freshwater (Donaghey 2013).

(ECD) Notable aspects concerning migration	The Site supports migratory bird species listed under international agreements.
(ECD) Pressures and trends concerning any of the above, and/or concerning ecosystem integrity	Land use in the surrounding area may threaten nutrient cycling within the Site. Potential acid sulfate soils at the Site may impact the critical components and processes. Inappropriate fire could further damage/ destroy vegetation and peat deposits.

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	☑	☑

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):

The Site is Crown Land reserved as part of a State Reserve. The Ramsar Site was initially listed in 1982 as the Sea Elephant Conservation Area and its boundary corresponded with the Sea Elephant River Wildlife Sanctuary. In 1988 the Sanctuary was incorporated into the adjoining Lavinia Nature Reserve. The Ramsar Site boundary was redefined in 1994 to correspond with the Lavinia Nature Reserve boundary. The status of the reserve was again changed in 2001 to a State Reserve under the National Parks and Reserves Management Act 2002. The State Reserve was extended in 2011 so the boundaries of the Ramsar Site and the State Reserve are no longer the same.
Within the Site, there is a mari-culture lease, for an oyster farm within the Sea Elephant Estuary.
Most surrounding land is private freehold and Conservation Areas including a Nature Reserve. In 2012, two additional private land titles (one of them bordering the site) now have perpetual conservation covenants.

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, Tasmanian State Government

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

Parks and Wildlife Service (PWS) Head Ranger (King Island)

Postal address:

General Parks and Wildlife Service Enquiries:
PO Box 1751
Town: Hobart
State: TAS
Postcode: 7001
Business Phone: 1300 827 727

King Island Field Office:
PO Box 104
Town: Currie
State: TAS
Postcode: 7252
Business Phone: 03 6462 1608

E-mail address: Kinglsland@parks.tas.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
Commercial and industrial areas		unknown impact	☐	No change	☑	unknown

Water regulation

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

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	☐	No change

Energy production and mining

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Oil and gas drilling		unknown impact	☐	No change	☑	unknown
Mining and quarrying		unknown impact	☐	No change	☑	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	☑	unknown

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	unknown impact		☑	unknown	☑	unknown

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Fire and fire suppression	High impact		☑	unknown	☐	unknown
Vegetation clearance/ land conversion	unknown impact		☐	unknown	☑	unknown

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	unknown impact		☑	unknown	☐	unknown

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Agricultural and forestry effluents	unknown impact		☐	No change	☑	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		unknown impact	☑	unknown	☑	unknown
Droughts		unknown impact	☑	unknown	☑	unknown
Temperature extremes		unknown impact	☑	unknown	☑	unknown
Storms and flooding		unknown impact	☑	unknown	☑	unknown

Please describe any other threats (optional):

Threats include:
• Fire: Nook Swamp and surrounding peatlands may be severely impacted/lost with a sufficiently hot fire. Burning saltmarsh vegetation around Sea Elephant Estuary could destroy feeding and roosting areas for the orange-bellied parrot. Fire damage to peat deposits changes surface topography and hydrology. Extensive peat loss increases drainage efficiency in some areas, and local peat loss increases the area of ephemeral open water wetlands in others. Promoting drainage in neighbouring areas of peat, increase the vulnerability to further peat combustion in the future.
• Recreation (vehicles): vehicles damage the saltmarsh community as they are very fragile, easily destroyed, and take many years to regenerate (PWS 2000). Vehicles threaten surface hydrology and drainage patterns, and beach nesting shorebirds, reducing species abundance, diversity and changing distribution patterns (Barnes et al. 2000). Vehicles can spread weeds and diseases.
• Water quality: land use practices in the upper catchment threatens the saltmarsh communities (Barnes et al. 2002). Elevated nutrients and low dissolved oxygen concentrations are caused by poor riparian vegetation cover and unlimited stock access to the stream channel (Bobbi 1999).
• Upper catchment drainage: impacts stream condition (water quality and channel stability) and lowers the water table, leading to wetland/peat desiccation and increased probability of fire.
• Past land clearance: upstream has altered the water balance with less evapotranspiration of rainfall, a build-up of groundwater, mobilising and discharging salts from the soils (Dyson, undated).
• Weeds: many species found at the Site that threaten infestation.
• Acid sulfate soils: there is a high likelihood of potential acid sulfate soils particularly at Nook Swamp, the interdunal peats, and Sea Elephant Estuary.
• Phytophthora cinnamomi: is a destructive and widespread exotic species of water mould that causes root-rot disease symptoms (dieback) and death of many native plant species.
• Batrachochytrium dendrobatidis (chytrid fungus): infects the skin of frogs, destroying its structure and function, and can ultimately cause death (DPIWE 2010). The Site was tested positive for chytrid, which is a threat to the Site's amphibian fauna.
• Cats: pose a threat to the native wildlife, including the orange-bellied parrot, other bird species, small reptiles and mammals (Donaghey 2003; PWS 2000).
• Aquaculture (oyster farm): impacts include inputs of nutrients; occasional opening of the barred estuary for tidal flushing; and farm vehicles driving within the estuary.
• Climate change: increasing temperatures; fewer frosts; less rainfall in the cool season; increased intensity of extreme events; sea level rise; and a harsher fire-weather climate.
• Mining: leases have been granted to Tasmanian Titanium Pty Ltd. to mine mineral sand south of the Lavinia Reserve, posing a potential threat to the geomorphology of the Site.

5.2.2 - Legal conservation status

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Conservation Area	Sea Elephant Conservation Area		partly
State Reserve	Lavinia Nature Reserve		whole

Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	King Island	http://datazone.birdlife.org/site/factsheet/king-island-iba-australia	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
Soil management	Partially implemented

Species

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

Human Activities

Measures	Status
Regulation/management of recreational activities	Implemented
Communication, education, and participation and awareness activities	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).

The Lavinia State Reserve Draft Management Plan (PWS 2000, details management objectives and prescriptions for natural and cultural values within the Reserve. PWS are currently reviewing the Management Plan; consultation undertaken in the development of the King Island Biodiversity Management Plan should ensure that actions identified in the two plans are complementary (Threatened Species Section 2012).

Soil management: Management recommendations for the root rot fungus are available that can be adopted by the community and industry which would minimise the spread of this pathogen (KINRMG 2010).

Dog Control: The King Island Council has adopted a by-law that controls dog ownership and is consistent with the Tasmanian Dog Control Act 2000. Under the Act there are provisions to declare an area containing sensitive habitat for native wildlife to be an area where dogs are prohibited from entering. Dogs are prohibited from entering the Lavinia State Reserve (Threatened Species Section 2012).

Cat control: The Tasmanian Parks and Wildlife Service have been carrying out cat trapping across the Island since approximately 1993. Control has been focused on the protection of threatened species and Lavinia State Reserve (Threatened Species Section 2012).

Weed Management: the King Island Weed Management Strategy (Threatened Species Section 2012).

Threatened species management:
• Identify Nook Swamps site as a fire-exclusion zone within the King Island Wildfire Management Plan and, in the event of wildfire, where practicable take measures to protect the site (Threatened Species Section 2012).
• Develop, resource and implement fire management plans to protect the Lavinia State Reserve and Colliers Swamp (Threatened Species Section 2012).
• The King Island Biodiversity Management Plan (Threatened Species Section 2012) includes recovery actions including both regulation and community education for the following threatened species that occur at the Lavinia Ramsar Site:
• White-bellied Sea Eagle.
• Green and Gold Frog
• Orange-bellied Parrot
• Little Tern
• Fairy Tern
• Hooded Plover

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

5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Plant community	Proposed
Animal community	Proposed
Animal species (please specify)	Proposed

A monitoring program for the King Island Brown Thornbill and King Island Scrubtit is being implemented(Threatened Species Section 2012; Webb and Bell 2023).
Project objectives included establishing annual monitoring of Orange-bellied Parrot (Neophema chrysogaster), mapping of all foraging and roosting habitat, and the instigation of habitat protection measures on the island (Threatened Species Section 2012).
Specific actions recommended for the recovery of the two known populations of Scrambling groundfern (Hypolepis distans) on King Island included extension surveys of suitable habitat and on-ground protective measures and monitoring (Threatened Species Section 2012).

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

This RIS update has been prepared using information from the Lavinia Nature Reserve Ramsar site Ecological Character Description; Management Plan; past Ramsar Information Sheets; information provided by the Cradle Coast Authority; and other key information sources. A full bibliography is included as an attachment under Section 6.1.2 vi, and filename "AU253_lit230605__bibliography.docx".

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>

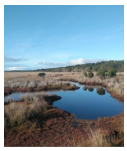
v. site management plan
<no file available>

vi. other published literature
<2 file(s) uploaded>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:

Martha surf break at Lavinia Beach (photo by Shelly Graham) (*Shelly Graham, 07-06-2016*)



Elephant River saltmarsh (photo by Shelly Graham) (*Shelly Graham, 05-01-2021*)

6.1.4 - Designation letter and related data

Designation letter
<1 file(s) uploaded>

Date of Designation: 1982-11-16