

Information Sheet on Ramsar Wetlands (RIS) – 2009-2014 version

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Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX.22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 17, 4th edition).
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

September 2014

3. Country:

Australia

4. Name of the Ramsar site:

The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.

Logan Lagoon

5. Designation of new Ramsar site or update of existing site:

This RIS is for (tick one box only):

a) Designation of a new Ramsar site ☐; or

b) Updated information on an existing Ramsar site ☒

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area

The Ramsar site boundary and site area are unchanged: ☒

or

If the site boundary has changed:

- i) the boundary has been delineated more accurately ☐; or
- ii) the boundary has been extended ☐; or
- iii) the boundary has been restricted** ☐

and/or

If the site area has changed:

- i) the area has been measured more accurately ☐; or
- ii) the area has been extended ☐; or
- iii) the area has been reduced** ☐

**** Important note:** If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

No major changes to the ecological character of the site could be identified between listing and present day, mainly due to a paucity of information. Many of the physical site features that supported its initial listing, such as the Holocene shorelines and coastal barrier system remain unchanged, although see Section 26 below.

One component that can be compared between the present conditions and those at the time of listing is water quality. Water samples from Pot Boil Creek in 1982 and 2009 display similar characteristics, with surface water inputs to Logan Lagoon dominated by sodium and chloride ions. However, given the ephemeral nature of the site, two water samples taken 28 years apart tell little about the change between sampling events.

The Ramsar criteria for identifying wetlands of international importance have been reviewed in the period since the site was first designated. Under the current criteria, Logan Lagoon Ramsar site meets the fourth and sixth criterion in addition to the original three criteria for which the site was listed (Section 13). Furthermore, an additional five wetland types have been identified at the site (Section 19).

7. Map of site:

Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

- i) a hard copy (required for inclusion of site in the Ramsar List): ☐;
- ii) an electronic format (e.g. a JPEG or ArcView image) ☒;
- iii) a GIS file providing geo-referenced site boundary vectors and attribute tables ☐.

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park, etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The boundary of Logan Lagoon Ramsar site is shown as Lot 1 on Central Plan Register (CPR) 5650 from the Tasmanian Information and Land Services, Department of Primary Industries, Water and Environment. CPR 5650 horizontal datum is Australian Geodetic Datum (AGD66) Universal Transverse Mercator Projection Australian Map Grid (UTM AMG66) and Australian Height Datum (Tasmania) for vertical datum (Figure 1).

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>.

8. Geographical coordinates (latitude/longitude, in degrees and minutes):

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

Latitude: 40° 11' 59.53949"S; Longitude: 148°19' 06.10150"E

9. General location:

Include in which part of the country and which large administrative region(s) the site lies and the location of the nearest large town.

Logan Lagoon Ramsar site is situated on the south-east corner of Flinders Island in Bass Strait, Tasmania, Australia, approximately six kilometres north-east of the township of Lady Barron. In 2011 census the population of Lady Barron was 262 (Australian Bureau of Statistics, Census of Population and Housing 2011). Logan Lagoon is part of a coastal lagoon system that comprises three large estuarine lagoons along the eastern coastline of Flinders Island. The site extends from the southern shore of South Chain Lagoon in the north down to Wilsons Lagoon in the south, bounded by the sea to the east and south, Logan Lagoon Conservation Area to the north, with private property along approximately two-thirds of the western and north-western shore. Flinders Island falls within the Flinders municipality, which had a population of 864 in 2006 (Australian Bureau of Statistics 2010).

10. Elevation: (in metres: average and/or maximum & minimum)

The entire site is less than 20 metres above sea level.

11. Area: (in hectares)

2,257 hectares

As provided in 2005 RIS, an update to the Central Plan Register (CPR) used to map the area (CPR 5650) identified a technical error. Error in Low Water Mark has been corrected to arrive at this area.

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Logan Lagoon is one of three large estuarine lagoons which make up a coastal lagoon system that extends along the eastern coastline of Flinders Island. The site contains two sites listed on the Tasmanian Geoconservation Database; Logan Lagoon Holocene Shorelines and Planter Beach Coastal Barrier System, which are of conservation significance for Tasmania.

Logan Lagoon estuary is the main hydrological feature at the site, comprising approximately 42 percent of the reserved area. The lagoon is an important area for resident and migratory birds and a number of threatened species, including 21 migratory waders, have been recorded at the site. Other non-avian fauna also use the site for foraging, breeding, or as habitat refuge, such as the endangered freshwater fish species, the dwarf galaxias (*Galaxiella pusilla*).

The site supports a diverse range of wetland vegetation including saltmarsh, herblands, heath fields, and periodically inundated scrub, some of which are threatened or of conservation significance in the Tasmanian bioregion. The dominant vegetation community is forest, comprising approximately 48 percent of the site (TASVEG 2009).

13. Ramsar Criteria:

Tick the box under each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11). All Criteria which apply should be ticked.

1 •	2 •	3 •	4 •	5 •	6 •	7	8 •	9
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Criterion 1 – (contains representative/rare/unique wetland type in appropriate biogeographic region).

The site is an excellent, regionally representative example of a coastal estuarine wetland system, and comprises a diverse range of seasonal and permanent marshlands, grass and heathlands, forests, and woodlands, many of which support threatened species and communities within the Tasmanian bioregion and the Bass Strait IMCRA Province. In particular, the site contains excellent, near pristine, representative examples of a range of coastal wetland types, such as intertidal marshes, sandy shores, coastal lagoon, seasonal and permanent rivers, marshes, and pools, as well as shrub dominated wetlands.

Logan Lagoon, with other lagoons and dunes in the area, provides a representative and outstanding example of the development of Holocene shorelines for Tasmania. Similarly, the Planter Beach Coastal Barrier System is partly within the site. It is a representative and outstanding example of how offshore bars formed with Holocene sea level rise, and how barrier growth has enclosed the coast, forming large lagoons. These two sites are listed on the Tasmanian Geoconservation Database for their conservation significance. Logan Lagoon is a Tasmanian estuary of critical conservation significance (Edgar *et al.* 1999) and has been assessed as a wetland in near-pristine condition for the Tasmanian Bioregion (Dunn 2002). This criterion was met at designation in 1982 and continues to be met at present.

Criterion 2 – (supports vulnerable, endangered, or critically endangered species or threatened ecological communities)

English Name	Scientific Name	IUCN Status	CITES	CMS	National Status
Fish					
Dwarf Galaxias	<i>Galaxiella pusilla</i>	Vulnerable-	-	-	Vulnerable (EPBC Act 1999)
Birds					
Fairy Tern	<i>Sterna nereis</i>	Vulnerable			Vulnerable (EPBC Act 1999)
Wedge-tailed Eagle	<i>Aquila audax fleayi</i>				Endangered (EPBC Act 1999)
Forty-spotted pardalote	<i>Pardalotus quadragintus</i>	Endangered			Endangered (EPBC Act, 1999)
Ecological Communities					
Saline aquatic herbland					Vulnerable (TSP Act, 1995)
Freshwater aquatic herbland					Vulnerable (TSP Act, 1995)
Lacustrine herbland					Vulnerable (TSP Act, 1995)

Criterion 3 – (Supports populations of plant and animal species important for maintaining the biological diversity of a biogeographic region)

The 1998-1999 Shorebird Survey (Bryant 2002) for Tasmania found Logan Lagoon (combined with nearby Cameron Inlet) has high migratory and shorebird diversity and is a priority site for resident species. More recent surveys (Woehler and Ruoppolo, 2013; Woehler, 2008) confirm this. The site provides breeding habitat for the little tern (*Sterna albigifrons*) (endangered), a beach nesting shorebird listed as threatened under the TSP Act. The survey also recorded the largest count for two migratory species;

curlew sandpiper (*Calidris ferruginea*), 1000 birds and red-necked stint (*Calidris ruficollis*), 4000 birds. Logan Lagoon is listed as an important site for these two species under the East Asian - Australasian Shorebird Site Network (Bamford *et al.* 2008). There are 129 bird species (native, migratory and introduced) recorded within a 6 kilometre radius of the Logan Lagoon Ramsar site. For these reasons, the lagoon is not only important on a local scale, but also nationally and internationally.

Fourteen of the 35 native mammal species present on mainland Tasmania, six of the 11 Tasmanian frog species, nine native freshwater fish species and 14 species of reptile occur on Flinders Island, and all of which are likely to occur in the Logan Lagoon Ramsar site (DSEWPac 202).

A total of 21 migratory wader species have been recorded at the site and all of these, with the exception of the double-banded plover (*Charadrius bicinctus*), breed in the Arctic region during the northern hemisphere summer. Double-banded plovers breed in New Zealand and some of the population over-winters in Australia.

Many of the migratory birds recorded at the site are listed on international agreements such as CMS, CAMBA, JAMBA, or ROKAMBA. These species are:

- cattle egret (*Ardea ibis*), CAMBA
- ruddy turnstone (*Arenaria interpres*), JAMBA, CAMBA, ROKAMBA
- sharp-tailed sandpiper (*Calidris acuminata*), JAMBA, CAMBA, ROKAMBA
- sanderling (*Calidris alba*), JAMBA, CAMBA
- lesser sand plover (*Charadrius mongolus*), JAMBA, CAMBA, ROKAMBA
- Latham's snipe (*Gallinago hardwickii*), JAMBA, CAMBA, ROKAMBA
- Caspian tern (*Hydroprogne caspia*), JAMBA, CAMBA
- bar-tailed godwit (*Limosa lapponica*), JAMBA, CAMBA, ROKAMBA
- eastern curlew (*Numenius madagascariensis*), CMS, JAMBA, CAMBA, ROKAMBA
- whimbrel (*Numenius phaeopus*), JAMBA, CAMBA, ROKAMBA
- Pacific golden plover (*Pluvialis fulva*), JAMBA, CAMBA, ROKAMBA
- little tern (*Sterna albifrons sinensis*), JAMBA, CAMBA, ROKAMBA
- common greenshank (*Tringa nebularia*), JAMBA, CAMBA, ROKAMBA

(JAMBA: listed under the Japan – Australia Migratory Birds Agreement, CAMBA: listed under the China – Australia Migratory Birds Agreement, ROKAMBA: listed under the Republic of Korea – Australia Migratory Birds Agreement, Migratory, CMS: listed under the Convention on Migratory Species)

This criterion was likely to be met at designation in 1982 and continues to be met at present.

Criterion 4 – (*A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions*)

Logan Lagoon provides important resting and feeding areas for waterbirds and migratory shorebirds. In 2002-2003, with severe drought conditions in mainland Australia, a flock of approximately 3000 banded stilts (*Cladorynchus leucocephalus*) arrived at Logan Lagoon and remained in the area for approximately 8 months. This is the highest number of stilts ever recorded in Tasmania (Olsen and Weston 2004; Woehler and Park 1997).

Apart from the finding of the 1998-1999 Shorebird Survey for Tasmania (see Criterion 3), an earlier survey (1984) counted 2,470 curlew sandpipers (*Calidris ferruginea*) at Logan Lagoon (Bamford *et al.* 2008). A shorebird survey on Flinders Island in 2008 (Woehler 2008) recorded 68 hooded plovers (*Thinornis rubricollis*) along Logan Lagoon beach between Pot Boil Point and Cameron Inlet, a species known to be decreasing in south-eastern Australia (Bryant 2002). This criterion was met at designation in 1982 and continues to be met at present.

Criterion 6 – (*A wetland should be considered internationally important if it regularly supports 1 per cent of the individuals in a population of one species or subspecies of waterbird*)

English Name	Scientific Name	Subspecies/Population (if applicable)	Count (min-max)	1% Threshold
Musk duck	<i>Biziura lobata</i>	Tasmania	7-5200 (1985-2009)*	100
Chestnut teal	<i>Anas castanea</i>	SE Australia	22-1819 (1985-2009)*	1000
Hooded plover	<i>Thinornis rubricollis</i>		68 (2008) (Source: Woehler 2008)	45
Fairy tern	<i>Sterna nereis</i>		250 (2002) (Source: Bryant 2002)	15

* Data derived from annual counts by DPIPWE in most years since 1985 (DSEWPac 2012).

Using population estimates obtained from the fifth edition of Waterbird Population Estimates (Wetlands International 2012), the site regularly supports 1% of the global or regional population of Musk duck and Chestnut teal (see table). This is based on survey data obtained from waterfowl counts (DSEWPac 2012, Bryant 2002 and Woehler 2008) as discussed under Criterion 3 and 4. During periods of inundation the area has contained high numbers of waterbirds. Concomitant with water levels, numbers for waterfowl species have generally been low in most years over the last decade (DSEWPac 2012). More recent surveys have been focused on the King Island region and not the site so no additional data is available.

Populations of Hooded plover and Fairy terns have also met the 1% population thresholds however, given the limited monitoring at the site, it is difficult to determine whether the site meets the Ramsar criteria for 'regular' use for these populations. The November 2008 survey data show that Flinders Island holds more than 2% of the Australian populations of Hooded plovers and Pied oystercatchers, and at least 1% of the Australian population of Sooty oystercatchers (Woehler and Ruoppolo, 2013; Woehler, 2008). The east coast beaches between Pot Boil Point and North East River (approximately 70 km) are particularly significant for resident shorebirds. The high value of east coast beaches between Pot Boil Point and North East River to Hooded and Red-capped plovers is apparent from all surveys conducted (Woehler, 2008). It is likely that this criterion was met at designation in 1982 and continues to be met at present.

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region: Tasmania Drainage Division, Flinders–Cape Barren islands River Region

b) biogeographic regionalisation scheme (include reference citation): Commonwealth of Australia (Bureau of Meteorology), 2011, Australian Hydrological Geospatial Fabric.

16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Logan Lagoon is part of an extensive eastern Flinders Island parallel dune – coastal barrier system. The site contains a number of old, slightly higher than present, strand lines suggesting recent uplift or higher mid-Holocene sea levels. The site is predominantly sands, occurring in dunes or sandy plains. Physical processes within the lagoon are apparent by landforms that include a series of recurved spits along the former western shoreline, and a linear island in the northwest corner.

The lagoon has a perimeter of 32.3 kilometres with an area of 9.7 square kilometres (Edgar *et al.* 1999), or approximately 14 percent of the sub-catchment. The lagoon is shallow with depths of generally one to two metres and isolated from the sea by a sand bar that is open intermittently (Parks and Wildlife Service 2007).

Flinders Island has a relatively temperate climate that is due to the stabilising effect of surrounding ocean waters and temperatures only vary by six to seven degrees Celsius (°C) throughout the year. July is the coldest month of the year, with mean minimum and maximum temperatures of six and 13°C respectively. February is the warmest month, with mean minima and maxima temperature of 13.5 and 22.4°C respectively.

Flinders Island receives an annual average rainfall of 736 millimetres, ranging from 374.1 millimetres (2006) to 1164.9 millimetres (1956). The long term average was six percent higher (777 millimetres) during the 25 years leading up to Ramsar listing (1957-1982). In contrast, annual rainfall (687 millimetres) was 7 percent below the long term average in the 25 years since Ramsar listing (1983-2008). Flinders Island receives most rainfall in winter and early spring, coinciding with the persistent westerly winds. The months of January and February are the driest, whereas July and August are the wettest. The reduction in annual rainfall following listing (1982) is also apparent in the average monthly rainfall. With the exception of January, June and November, average monthly rainfall totals declined in the 25 years between 1983 and 2008 (compared with 1957 to 1982). Large decreases (greater than 20 percent) in monthly average rainfall are evident for February (40 percent), May (30 percent), March (27 percent) and July (20 percent).

The Logan Lagoon estuary is the main hydrological feature at the site, comprising approximately 40 percent of the reserved area. Logan Lagoon receives water from the following sources: surface water inflows from Pot Boil Creek and its tributaries; direct rainfall over the lagoon; groundwater recharge from the uppermost aquifer beneath the lagoon; and, inflows of seawater via the lagoon entrance. In the drier summer and autumn months, persistent winds, warm temperatures and long periods of daylight contribute to high evaporation rates, and the lateral extent and volume of water in the lagoon decreases. Extended dry periods are known from 1995 to 1996, 1997 (Edgar *et al.* 1999) and 1998 to 2000, where water was contained only in the southernmost section of the lagoon (Parks and Wildlife Service 2007).

Groundwater interaction is poorly understood, yet undoubtedly forms a key part of the hydrological regime at the site, especially the water quality in the lagoon. Groundwater in this region of Flinders Island flows from west to east; passing beneath Logan Lagoon, and eventually discharging to sub tidal marine waters (Lynch 2007; REM and Aquaterra 2008). The water table occurs very close to the soil surface (Parks and Wildlife Service 2007) and fluctuates according to seasonal variation.

The highest rates of surface water recharge occur during winter and spring when direct rainfall recharge, groundwater recharge and freshwater inflows from Pot Boil Creek are at a maximum, resulting in increased water levels in the lagoon. Inflows from Pot Boil Creek can be nil during dry periods, with anecdotal accounts indicating that that creek is intermittent and often dries out for extended periods (D. Bailey, adjacent landowner, *personal communication*, July 2009).

Seawater exchange with lagoon water occurs during periods when the lagoon entrance is open to the sea, although this is a relatively infrequent event. Factors that affect the lagoon water levels include tides, extent of bar erosion and storm activity. Breaching the lagoon entrance causes a rapid change in the physical composition of the water within the lagoon. Easterly storms, which are more common in summer, can also result in breaching of the lagoon entrance (Parks and Wildlife Service 2007).

The lagoon has a neutral pH, salinities similar to seawater, is relatively clear and has moderate levels of nutrients, particularly phosphate. The elevated levels of nutrients are most likely the result of runoff from nearby farmland in the catchment.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

Logan Lagoon is located in the Logan Lagoon subcatchment, which comprises an area of 75 square kilometres (Parks and Wildlife Service 2007) in the southeast of Flinders Island. The subcatchment is undulating and includes a number of watercourses (mostly man-made drains) that extend several kilometres to the west of the lagoon, including the Boot Jack Flats drainage area. A number of these watercourses are tributaries of Pot Boil Creek, which is the only natural watercourse that enters Logan Lagoon (Parks and Wildlife Service 2007). Land use in the subcatchment is mostly cleared land for grazing agricultural purposes, with the potential for runoff to transport sediments, pesticides, herbicides and fertilisers into the subcatchment watercourses (Parks and Wildlife Service 2007).

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Logan Lagoon maintains and regulates the hydrological cycles and regimes including: groundwater recharge from surrounding impermeable granite catchments; flood control and erosion protection; retention, recovery and removal of excess nutrients and pollutants, and; the maintenance of natural ecosystems in lagoon. Other possible regulating services include: the regulation of climate; mitigation of greenhouse gases; and protection of the extensive coastal dunes system and surrounding low-lying land from inundation during rough seas.

The hydrology at the site also contributes to the availability of habitat for the dwarf galaxias, which supports selection of Criterion 2. The dwarf galaxias (*Galaxiella pusilla*) lives in still or slow-flowing waters such as ponds, swamps, drains and backwaters of streams, often containing dense aquatic or emergent plants. Known Tasmanian sites appear to be associated with Holocene sand, gravel and alluvium deposits, of which Logan Lagoon is representative.

19. Wetland Types

Under the Ramsar wetland classification system eight types of wetland occur within the Logan Lagoon Ramsar site, three are marine/coastal (E, H, J), and five are inland wetland types (N, Tp, Ts, Ss, W). The current (2010) update of the RIS has identified additional wetland types H, Ss, Ts, Tp and W to the three identified previously (J, E and N).

The five additional wetland types were selected by comparing the description of TASVEG 2.0 mapped vegetation communities (Harris and Kitchener 2005; TASVEG 2009) with the Ramsar wetland types. Most of the newly identified Ramsar wetland types support species, communities, or features that are of conservation significance within the Tasmanian bioregion, or are poorly represented in other Ramsar wetlands. For example, the wetland types Ss, Tp, and Ts relate to the vegetation communities 'Saline aquatic herbland' (AHS), 'Fresh water aquatic herbland' (AHF), and 'Lacustrine herbland' (AHL), respectively, listed as vulnerable in Tasmania. Further, the identification of Ss wetland type is encouraged by the Ramsar Convention's so as to secure the sustainable use of temporary pools, and to identify and designate temporary pools as Ramsar sites. The Ss wetland type is justified by the characteristics of Halfway Lagoon and Wilsons Lagoon in the far south of the Logan Lagoon Ramsar site.

a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • M • N • O • P • Q • R • Sp • Ss • Tp • Ts • U • Va •
Vt • W • Xf • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

J, Ts, E, Ss, W, H, Tp, N

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The low lying country around Logan Lagoon comprises unconsolidated sediments covered with a complex mosaic of sedgeland, heathland, grassland herbfield, scrub and forest. The vegetation communities of Logan Lagoon and the Flinders Island east coast plain exhibit good examples of native

coastal vegetation and contain remnant patches of pre-European vegetation. The site supports at least 12 vegetation communities, including four wetland community types, two types of grassland, three types of scrub/heathland and three forest/woodland communities. The wetland-dependent vegetation communities include Lowland sedgy heathland, Saline aquatic herbland, Saline sedgeland and rushland, Fresh water aquatic herbland, and *Melaleuca squarrosa* scrub (partially wetland-dependent).

The lagoon is fringed with *Juncus* reed beds (Saline sedgeland and rushland) and there are pockets of golden speargrass (*Stipa stipoides*) grassland and coastal tussock grass (*Poa poiformis*) grassland. Samphire (*Sarcocornia quinqueflora*) is scattered on the fringes of the lagoon on the flats which are subject to periodic inundation. In poorly drained swales and along drainage channels coastal paperbark *Melaleuca ericifolia* thickets occur. *Allocasuarina littoralis* forest community dominates the south-east corner of Logan Lagoon at Pot Boil Point and occupies approximately 380 ha.

On the eastern side of the lagoon there is dense coastal shrubbery of coast wattle (*Acacia longifolia*) and coastal tea tree (*Leptospermum laevigatum*) interspersed with some grassy patches. North of Logan Lagoon on the leeward of other lagoons, there is forest and scrub which is subject to a higher fire frequency than the vegetation on the leeward side - the prevailing wind direction is from the west and north-west. The lagoons consequently act as fire breaks which protect the vegetation to the east of the lagoon from many fires.

A total of 129 species of birds (native, migratory and introduced) have been recorded within six kilometres of the Logan Lagoon Conservation Area. A total of 21 migratory wader species have been recorded at the site and all but one of these, double-banded plover (*Charadrius bicinctus*), breeds in the Arctic region during the northern hemisphere summer. Double-banded plovers breed in New Zealand and some of the population over-winters in Australia. Many of these migratory waders are listed under CAMBA, JAMBA, and ROKAMBA. Logan Lagoon is listed as an important site for the curlew sandpiper (*Calidris ferruginea*) and the red-necked stint (*Calidris ruficollis*) under the East Asian - Australasian Shorebird Site Network (Bamford *et al.* 2008). For these reasons, the lagoon is not only important on a local scale, but also nationally and internationally.

Four of the duck species recorded at Logan Lagoon – black duck (*Anas superciliosa*), Australian shelduck (*Tadorna tadornoides*), chestnut teal (*Anas castanea*) and grey teal (*Anas gracilis*), are considered as game species and hunted in Tasmania during an annual duck season (Olsen and Weston 2004, Parks and Wildlife Service 2007). The lagoon is an important refuge for these species, as hunting is not permitted within the Ramsar site. During periods of inundation the area has contained numbers as high as 800 black duck, 1200 Australian shelduck, 1800 chestnut teal and 550 grey teal for these hunted species. The area has also been important for black swan and musk duck, with maximum numbers of 3850 and 5200 recorded for these species, respectively. Concomitant with water levels, numbers for waterfowl species have generally been low in most years over the last decade.

There is a paucity of information on fauna other than birds. Fauna likely to occur at the site were identified using database searches, however, records from database searches were sparse and sightings of species were often many years apart. The following native taxa have been observed on Flinders Island and are likely to occur at Logan Lagoon: six frog species; fourteen reptile species, and; nine freshwater fish species (Edgecomb, 2007).

The benefits and services most relevant for Logan Lagoon are grouped into supporting services, regulating services, and cultural services. There were no provisioning services identified.

Supporting Services: Logan Lagoon maintains regional biodiversity by: supporting a number of representative, rare or unique wetland types; supporting regionally, nationally and internationally threatened species and communities; providing habitat for plant and animal species that contribute to the biodiversity of the Tasmanian bioregion; supporting critical life stages or provides refuge; and, supporting migratory and resident waterbirds.

Alluvial processes occurring within Logan Lagoon contribute to the formation of geological features such as shorelines and sand dunes via the deposition of sediments. Accumulation of organic matter provides nutrients for flora communities which help to stabilise the dunes systems. The lagoon facilitates storage, recycling, processing and acquisition of nutrients for use by other organisms inhabiting or using the site.

Regulating services: Logan Lagoon maintains and regulates the hydrological cycles and regimes including: groundwater recharge from surrounding impermeable granite catchments; flood control and erosion

protection; retention, recovery and removal of excess nutrients and pollutants, and; the maintenance of natural ecosystems in lagoon. Other possible regulating services include: the regulation of climate; mitigation of greenhouse gases; and protection of the extensive coastal dunes system and surrounding low-lying land from inundation during rough seas.

Cultural services. A range of activities are conducted at the site, including: recreational fishing on the ocean beaches, canoeing, and kayaking occur on the lagoon. Surfers access the areas to the East and South via the site. Walking and nature observation, such as amateur bird watching and photography, as well as nature based tourism are popular at the site. The site may have religious significance or be a spiritual and inspirational place for some visitors.

Scientific and educational. The site has education value in serving as a demonstration of a near-natural wetland. The coastal dune system is recognised as being of geoconservation significance on a regional scale. The monitoring of bird numbers at the site provides important information on the long term status of some threatened birds.

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Three saltmarsh and wetland community types occurring at the site are listed as vulnerable under the Tasmanian Nature Conservation Act 2002. Two of these, *Selliera radicans* herbfield associated with Lacustrine Herbland and *Lamprothamnium* aquatic herbland associated with Saline aquatic herbland, are considered poorly reserved in Tasmania. The vegetation *community* 'Lowland Native Grasslands of Tasmania', listed as a critically endangered under the EPBC Act, is extensive throughout the site. Including the abovementioned, the site supports six vegetation communities recognised as being rare or vulnerable in Tasmania.

There are remnant communities of conservation significance (Harris 1989) on the eastern side of the lagoon. The prevailing wind direction is from the west and north-west and the lagoon acts as a fire break which protects vegetation from many fires. This more protected vegetation is dominated by Smithton peppermint *Eucalyptus nitida*, *L. laevigatum* and honeysuckle *Banksia marginata* and Oyster Bay pine *Callitris rhomboidea* (listed as rare under the Nature Conservation Act 2002).

Recent years have seen the spread and new invasions of exotic plants throughout Flinders Island. A number of introduced plant species as well as the root-rot fungus (*Phytophthora cinnamomi*) have been introduced to the site. Pampas grass (*Cortaderia selloana*), a prohibited weed species, slender thistle (*Carduus pycnocephalus*), spear thistle (*Cirsium vulgare*) and African boxthorn (*Lycium ferocissimum*) are all listed as secondary weeds in Tasmania (Parsons & Cuthbertson 1992). Sea spurge (*Euphorbia paralias*) is also colonising the southern beach of the Ramsar site.

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

The dwarf galaxias (*Galaxiella pusilla*) has been identified at Logan Lagoon (TSS 2006) and is listed as rare on the Tasmanian TSP Act and as Vulnerable on the IUCN Red List and EPBC Act. The dwarf galaxias have a preference for still or slow-flowing waters such as ponds, swamps, drains and backwaters of streams, often containing dense aquatic or emergent plants (TSS 2006). Water bodies may be permanent, or temporary waters connected to permanent water. Known Tasmanian sites appear to be associated with Holocene sand, gravel and alluvium deposits (Chilcott and Humphries 1996); such conditions exist within Logan Lagoon.

Two other species of conservation significance recorded at Logan Lagoon are the wedge-tailed eagle (*Aquila audax fleayi*) (Endangered EPBC Act) and the forty-spotted pardalote (*Pardalotus quadragintus*), listed as nationally and globally Endangered (EPBC Act, IUCN Red List). Whilst these species are not wetland dependent, they are likely to feed in and around the lagoon.

There are observations of noteworthy fauna in the area surrounding the lagoon, including the common wombat (*Vombatus ursinus*) (listed as Vulnerable under the EPBC Act and IUCN Red List), and the New Holland mouse (*Pseudomys novaehollandiae*) (listed as Rare - TSP Act, and Vulnerable under the IUCN Red List). The Common Wombat (Bass Strait) is now only found on Flinders Island, and thus represents a threatened species that is restricted to the Tasmanian Bioregion. It is likely that these species occur at the site, although systematic surveys are required to confirm their presence.

Another species observed near the site, the green and gold frog (*Litoria raniformis*) is listed as Endangered on the IUCN Red List, and Vulnerable on the EPBC Act and TSP Act. Although there are no observations of the green and gold frog at Logan Lagoon, there is suitable habitat available which includes subsidiary streams and smaller lagoons. Natural and unnatural draining of the Lagoon poses a threat to this species because it creates very saline conditions and reduces available habitat. Protecting the lagoon from artificial draining would increase the value of the site as potential habitat for this species.

A number of threatened shorebirds have been recorded breeding in the Logan Lagoon Ramsar site. These are: the little tern (*Sterna albigrons*), which is listed as endangered under the Threatened Species Protection Act 1995 (TSP Act) and also listed under JAMBA/CAMBA; the fairy tern (*Sterna nereis*) which is listed as vulnerable (IUCN Red List); and the hooded plover (*Thinornis rubricollis*) which is not listed, but has a high conservation significance. The white-fronted tern (*Sterna striata*) occurs at the Logan Lagoon Ramsar site (but does not breed at the site) is listed as vulnerable (TSP Act). The lagoon provides important resting and feeding areas for waterbirds and migratory shorebirds. In 2002-2003, with severe drought conditions in mainland Australia, a flock of approximately 3000 banded stilts (*Cladorynchus leucocephalus*) arrived at Logan Lagoon and remained in the area for approximately eight months. This is the largest number of stilts ever recorded in Tasmania (Olsen and Weston 2004).

Cape Barren geese are considered to be the world's second rarest goose species (Parks and Wildlife Service 2007). The species was nearly hunted to extinction in the mid 1800s to early 1900s by sealers and settlers and was slow to recover until an increase in improved pasture in the Furneaux Islands from the 1960s saw the population increase to an estimated 15,000 (Parks and Wildlife Service 2007). Important in the recovery of this species was management action undertaken during the 1970s which saw areas of the Ramsar site planted with grass to provide a refuge and food source for the geese to attract them away from pasture on private property.

The most problematic introduced animals are pigs and cats which pose varying threats to the native fauna and flora. Feral pigs have caused extensive localised damage to terrestrial and wetland vegetation (Parks and Wildlife Service 2007). Feral cats are known to prey on native wildlife, but may also have indirect effects on native fauna by carrying and transmitting infectious diseases such as toxoplasmosis (DEWHA 2008).

23. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

Recreation and tourism: walking and nature observation such as amateur bird watching are common activities at the site. Nature-based tourism is a major source of income for Flinders Islanders and Logan Lagoon is visited on some tours. Recreational fishing occurs on the ocean beach to the East and South of the site. Water sports such as canoeing and kayaking may occasionally occur on the lagoon although it is not encouraged or advertised. Surfers access the beach areas to the East and South via the site.

Spiritual and inspirational: there may be appreciation of the natural features at the site through photography. The cultural heritage (historical and archaeological) of the site is unknown (see Section 23b below) but the site may have spiritual and religious significance.

Scientific and educational: The area has education value in serving as a demonstration of a relatively undisturbed wetland, containing examples of pre-European vegetation that are a valuable reference. The sites coastal dune system is recognised as being of geoconservation

significance on a local regional scale. Logan Lagoon has scientific value as a long-term monitoring site for migratory shorebirds, waders, and waterfowl.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

To date, no systematic archaeological surveys have been undertaken at Logan Lagoon so no sites of cultural significance have been identified. However the concentration of important cultural sites around freshwater lagoons at other locations on Flinders Island suggests that lagoons were a focus of activity and such sites may be present at Logan Lagoon.

If Yes, tick the box ☐ and describe this importance under one or more of the following categories:

- i) sites which provide 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) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where 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:

24. Land tenure/ownership:

a) within the Ramsar site: Logan Lagoon Ramsar Site is Crown land. It sits entirely within the Logan Lagoon Conservation Area which is reserved under the Tasmanian *Nature Conservation Act 2002* and managed by the Tasmanian Department of Primary Industries, Parks, Water and Environment. The Conservation Area was extended in 2002 to the north and west so the boundaries of the Conservation Area now extend beyond the Ramsar Site.

b) in the surrounding area: The site is bounded by sea to the east and south. Approximately one third of the northern and western boundaries are with the Logan Lagoon Conservation Area and two other smaller Crown reserves. The remaining two thirds of this boundary is with private property. The catchment of Logan Lagoon is approximately 8,460ha – 78% of which is Crown owned reserve land consisting of native vegetation and freshwater lakes. The remaining catchment area is mostly privately owned grazing land with areas of native vegetation interspersed.

25. Current land (including water) use:

a) within the Ramsar site: Conservation and low intensity recreation.

b) in the surroundings/catchment: The majority of the Logan Lagoon Conservation Area, and some of the private land, is covered with native vegetation. The clearance, drainage and reclamation of low-lying areas on the east coast of Flinders Island between the 1930s (Bootjack Flats area) and 1950s (east coast swamps) has increased the area of the catchment from its pre-settlement state. The majority of the land was reclaimed by soldiers who were granted settlement rights in return for their labour in clearing and draining some of the more inhospitable portions of the island. The runoff associated with these farms discharges into the catchment's main tributary, Pot Boil Creek - from as far away as Bootjack Flats - which subsequently feeds into the northern end of the lagoon.

In wet seasons the lagoons within the Logan Lagoon Conservation Area other than Logan Lagoon Ramsar site are used for hunting ducks during the open season.

The ocean waters adjacent to Logan Lagoon are used for a range of maritime activities including commercial and recreational fishing, SCUBA diving, surfing, and general boating. Boating on the lagoon itself is not common and is not encouraged.

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

a) within the Ramsar site:

There are several threats which could impact on the ecological character of the Logan Lagoon Ramsar site, including:

1. Unsustainable fire regime. The impact of frequent fires differs depending on the vegetation communities affected - some communities are more susceptible to changes in fire regime than others. For example, frequent firing has, in some areas, led to the replacement of woody vegetation by floristically poor bracken fields or tussock grasslands. (Parks and Wildlife Service 2007).
2. Unauthorised vehicle use. Off-road driving is not permitted within Logan Lagoon Ramsar Site. However, off-road driving occurs in the Ramsar site and in the area between Cameron Inlet and Logan Lagoon. Unauthorised off-road vehicle use is associated with a range of impacts to some of the Ramsar site's key natural values as it causes erosion, vegetation damage, disturbance of coastal breeding birds and destruction of their eggs.
3. Alteration to the drainage regime, including artificial opening of the lagoon mouth. Prior to listing there was a history of man-made breaches of the lagoon by local landholders attempting to reduce inundation of nearby agricultural land by lowering the water level in the lagoon (Parks and Wildlife Service 2007). Human interference in the natural hydrological processes of Logan Lagoon, such as artificial opening the ocean entrance, may be detrimental to species inhabiting the lagoon ecosystem, including, aquatic plant and algal species, fish, amphibians, birds, crustaceans, and gastropods (Parks and Wildlife Service 2007).
4. Introduction of animal and plant pests and diseases. The most problematic introduced animals are pigs and cats which pose varying threats to the native fauna and flora. Feral pigs have caused extensive localised damage to terrestrial and wetland vegetation (Parks and Wildlife Service 2007). Feral cats are known to prey on native wildlife, but may also have indirect effects on native fauna by carrying and transmitting infectious diseases such as toxoplasmosis (DEWHA 2008). A number of introduced plant species as well as the root-rot fungus *Phytophthora cinnamomi* have been unintentionally introduced to the site. Pampas grass (*Cortaderia selloana*), a prohibited weed species, slender thistle (*Carduus pycnocephalus*), spear thistle (*Cirsium vulgare*) and African boxthorn (*Lycium ferocissimum*) are all listed as secondary weeds in Tasmania (Parsons & Cuthbertson 1992). Sea spurge (*Euphorbia paralias*) is also colonising the southern beach of the Ramsar site.
5. Climate change via changing rainfall patterns, changing temperature and wind regimes, and/or more frequent and severe weather events.

b) in the surrounding area:

1. Surrounding land use/agriculture. Surface waters that enter Logan Lagoon have flowed through land that is subject to agricultural activities, particularly pasture improvement for grazing. Runoff and leaching into the water system of fertilisers, herbicides and pesticides may indirectly have a significant impact on the natural properties of the lagoon through changes in water parameters. Nutrient enrichment can lead to eutrophic conditions, where rapid growth and subsequent die-off of aquatic vegetation can result in smothering of wetland vegetation and may be harmful to aquatic fauna.
2. Modification of the natural flow into the lagoon (via further alteration to the drainage regime). Drains have been constructed on private land adjacent to Logan Lagoon so that runoff is channelled into Pot Boil Creek. Many of these drains have become overgrown with vegetation,

impeding the movement of water, and land adjacent to the lagoon becomes waterlogged. Consequently, the water level in the lagoon has often been blamed for waterlogging agricultural land, and artificial opening the lagoon ocean entrance without authority was common practice over the past 50 years. Local farmers believed that this relieved the inundation of land surrounding the lagoon (Municipality of Flinders 1987). However, an investigation of the inundation of farmland concluded that the waterlogging was caused by lack of water movement within the drains rather than the water level of the lagoon (Department of Agriculture 1987).

3. Offshore petroleum activities. Offshore petroleum activities might have several types of impacts to wetlands, including spills, infrastructure-related dredging impacts, and increased erosion.

27. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

Logan Lagoon is listed on the Register of the National Estate. A major extension to the Logan Lagoon Conservation reserve occurred in 2002 which added to the north between Cameron Inlet and Chain of Lagoons, and unallocated Crown Land to the west, adding approximately 2,607 ha to the reserve, bringing the total area to approximately 4,864 ha. It is anticipated that the Ramsar boundary may also be extended at some time in the future to include these additions.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ☐; Ib ☐; II ☐; III ☐; IV ☐; V ☐; VI ☒

c) Does an officially approved management plan exist; and is it being implemented?:

A Management Plan for Logan Lagoon Ramsar Site (Parks and Wildlife Service 2007) was prepared in accordance with the requirements of the National Parks and Reserves Management Act 2002 and was officially approved on the 26 August 2004. However, the general release of the plan was delayed until July 2009 and consequently it is unlikely that many of the recommendations have been implemented to date.

The objectives of the Management Plan are to ensure that the Logan Lagoon Ramsar Site will be managed to protect its outstanding natural and cultural values, and provide for an appropriate range of recreational opportunities. To these ends, the management plan proposes:

- greater involvement of the community, landowners and other stakeholders in management of the Ramsar site
- liaising with neighbouring land managers to achieve cooperative and complementary management of adjoining areas, to protect the values of the Ramsar site
- providing continued off-road vehicle access to the coast during summer under controlled conditions designed to protect vulnerable shorebirds, whilst restricting vehicle access in winter in order to limit environmental impact and protect fragile dunes, vegetation and the lagoon foreshore
- improving interpretation of the Ramsar site, and investigating the potential for a bird hide and short interpreted walk
- guidelines for artificial breaching of the lagoon mouth under conditions of high water.

d) Describe any other current management practices:

Flinders Planning Scheme 1994: The Flinders Island Planning Scheme applies to the lands and water under the jurisdiction of the Flinders Council. The scheme aims to ensure that land use or development and management practices shall be environmentally appropriate and avoid contamination or despoliation of the land, ground water, water courses, shorelines, lagoons and marshes. Sand-dunes, coastal vegetation

and ecologically important areas shall be protected from degradation. It is uncertain whether any of the prescriptions in the scheme are being implemented for Logan Lagoon and surrounding areas. Given the lack of water quality data for Pot Boil Creek it is unlikely that this scheme is protecting the lagoon from possible degradation.

State Policy on Water Quality Management 1997: Under this Policy, protected environmental values must be set for all Tasmanian groundwater and surface waters, including estuarine and coastal waters. Protected environmental values (the current uses, qualities and values of the water body) have been documented in a consultative process and water quality objectives have been set that will protect the environmental values of the waterway (TPC 1997). There is a lack of water quality information for Logan Lagoon and it is therefore unlikely that this policy is protecting the environmental values at the site.

State Coastal Policy 1996: The principles of this policy are that natural and cultural values of the coast are protected, that the coast shall be used and developed in a sustainable manner, and that integrated management and protection of the coastal zone is a shared responsibility. The coastal zone includes wetlands and lagoons immediately inland of the coast and Logan Lagoon would therefore be protected under this policy. This policy applies to developments in the vicinity of Logan Lagoon which would presumably protect the sites natural and cultural values (DPIPWE, 2009a).

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

A major extension to the Logan Lagoon Conservation reserve occurred in 2002, following the recommendations of an inquiry conducted by the Tasmanian Resource Planning and Development Commission. This inquiry into unallocated Crown Land on Flinders Island recommended Logan Lagoon Conservation Area be extended. The extension included land to the north between Cameron Inlet and Chain of Lagoons, and land to the west, adding approximately 2,607 ha to the reserve, bringing the total area to approximately 4,864 ha. It is anticipated that the Ramsar boundary may also be extended at some time in the future to include these additions.

The Management Plan (Parks and Wildlife Service 2007) recognised the importance of the Ramsar site at an international level, and suggested that the maximum protection possible under state legislation is necessary in order to recognise, protect and conserve its internationally significant wetland values. Currently the Ramsar site has Conservation Area status under Tasmanian State legislation. However, the objectives of management of conservation areas as set out in the National Parks and Reserves Management Act 2002 include several resource use objectives that are incompatible with the values of the Ramsar site. The objectives for conservation areas as set out in the Act that do not apply in Logan Lagoon Ramsar site are:

- to provide for exploration activities and utilisation of mineral resources;
- to provide for the taking, on an ecologically sustainable basis, of designated game species for commercial or private purposes, or both; and
- to provide for commercial or industrial uses of coastal areas.

Consequently, the Conservation Area classification is considered inadequate for the area. A more appropriate classification would be State Reserve, which allows for conservation of values, recreation and tourism use but precludes hunting, mineral exploration, mining and industrial use. The Management Plan recommended upgrading the status of the existing Ramsar Site to a state reserve under the National Parks and Reserves Management Act 2002 but this has not occurred to date. The upgraded status is not recommended for the conservation area outside the boundary of the Ramsar site.

Climate Futures for Tasmania Project: The Tasmanian Government, CSIRO and Hydro Tasmania, are cooperatively funding a research collaboration which will provide likely future climate information at local scales around Tasmania. The Climate Futures for Tasmania Project will provide projections that can be used for local decision-making, and importantly, to involve a broad cross section of the community promoting a more holistic approach to climate change adaptations. This project will be useful in predicting the impact of climate change on the Logan Lagoon Ramsar site.

29. Current scientific research and facilities:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

There are no permanent research facilities or recording devices at the site. Ongoing monitoring has been limited to counts of resident and migratory birds. Counts of shorebird and migratory species in the Logan Lagoon area were conducted in 2008 (Woehler 2008) and 2010 (Eric Woehler, *personal communication*, 18 Feb 2010). Annual counts of duck populations have been undertaken by DPIPWE in most years since 1985 prior to the duck hunting season. Other monitoring and research projects have been opportunistic and infrequent.

The Logan Lagoon Ramsar Site Management Plan (Parks and Wildlife Service 2007) specifies some priority research needs that would help to understand the ecological processes involved in the maintenance of the flora and fauna species and communities in the Ramsar site. Accurate baseline data, and relevant research and ongoing monitoring, are essential for understanding the health requirements of the wetland, particularly water quality and flow. These parameters are directly affected by activities in the catchment and research to determine the environmental water requirements for the lagoon, as well as monitoring any changes to its regime, is essential. Priorities for research and monitoring are detailed in the management plan and include the collection of baseline data on geomorphology, flora, fauna, hydrology, water quality, and cultural heritage of the Ramsar site.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Members of the local community as well as interested groups regularly use Logan Lagoon. However, the site has not been actively promoted or presented to the public, and is not widely appreciated outside the relatively small groups of local users and birdwatchers. Logan Lagoon has the potential to be an important educational resource for natural science, especially given its relatively pristine condition, its role as a sanctuary for migratory birds, and its other geological values.

Current CEPA activities relevant to the Logan Lagoon Ramsar site comprise:

- two interpretation signs in the Logan Lagoon Ramsar site at the two main access roads (Logan Lagoon road and Pot Boil road);
- shorebird monitoring projects coordinated by Birds Australia including collection of records for shorebird and migratory species in the Logan Lagoon area in 2008 (Woehler 2008).
- a similar survey in 2010 combined with a workshop for local residents. The workshop was attended by 27 locals who learnt important tools, including: how to identify resident and migratory birds; the status and trends of local bird populations; and how to record data to ensure it complies with existing data protocols. Several of the attendees showed a willingness to be involved with regular surveys of the local coastline (E. Woehler, Birds Tasmania, *personal communication*, 24 Jan 2010).
- annual counts of duck populations undertaken by DPIPWE in most years since 1985 before the duck hunting season. These surveys have often been conducted by local residents who are willing and able to identify the duck species that inhabit Flinders Island.
- an NRM North programme that has recently commenced to engage farmers in Property Management Planning. This project is aimed at encouraging sustainable farming practices in the catchment of Logan Lagoon and Cameron's Inlet.

The Logan Lagoon Ramsar site management plan (Parks and Wildlife Service 2007) makes several recommendations with regard to interpretation, education, and encouraging community involvement for Logan Lagoon. These include: maintaining existing interpretive signs; erecting signs at appropriate locations to indicate nesting shorebirds; and guidelines for observing the birds while minimising disturbance and impact.

The management plan also provides recommendations to encourage community involvement. These include supporting the development of friends and volunteer programs at the Ramsar site, developing relations with adjacent land managers, local community groups and the Aboriginal community, liaising with the tourism industry, recreational and educational groups regarding visitor uses of the Ramsar site,

and consulting with the Flinders Island Council to achieve complementary planning for land in the catchment of Logan Lagoon.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Logan Lagoon is visited by amateur naturalists, particularly for bird watching. It is advertised as a place to visit on tourism brochures, although the frequency or intensity of visitors to the site is unknown. Because of its proximity to Lady Barron, the Ramsar site is used for a range of recreation activities by local people as well as tourists. The beach areas are popular for fishing and surfing, with access generally by four wheel drive or quad bike.

Two wooden signs identify the Logan Lagoon Conservation Area. The signs are located on Logan Lagoon Road and Pot Boil Road, at the boundary of the Ramsar site. No camping areas have been constructed because of the close proximity to the township of Lady Barron. Similarly, no toilets have been provided at the Ramsar site (Parks and Wildlife Service 2007).

Birdwatching within the Ramsar site is a recreational pursuit which is often associated with beach walking. The high number of migratory and sedentary bird species which inhabit the Ramsar site makes this a popular activity. There are no formal walking tracks within the Ramsar site and this limits potential enjoyment of the area for increasing number of day users.

Off-road vehicle use occurs in the reserve and is associated with a range of impacts on some of the Ramsar site's key natural values. People access the area in off-road cars and bikes to go beach fishing, duck hunting on Crown Land, or to drive in a challenging environment (Parks and Wildlife Service 2007). See Section 26 for details of the threat caused by off road vehicles.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.

Territorial: Flinders Council. Functional: Parks and Wildlife Service – a division of the Department of Primary Industries, Parks, Water and Environment.

Telephone: +61 3 6165 4396

Information@dpipwe.tas.gov.au

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Director, Parks and Wildlife Service

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34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

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Figure 1: Central Plan Register CPR 5650

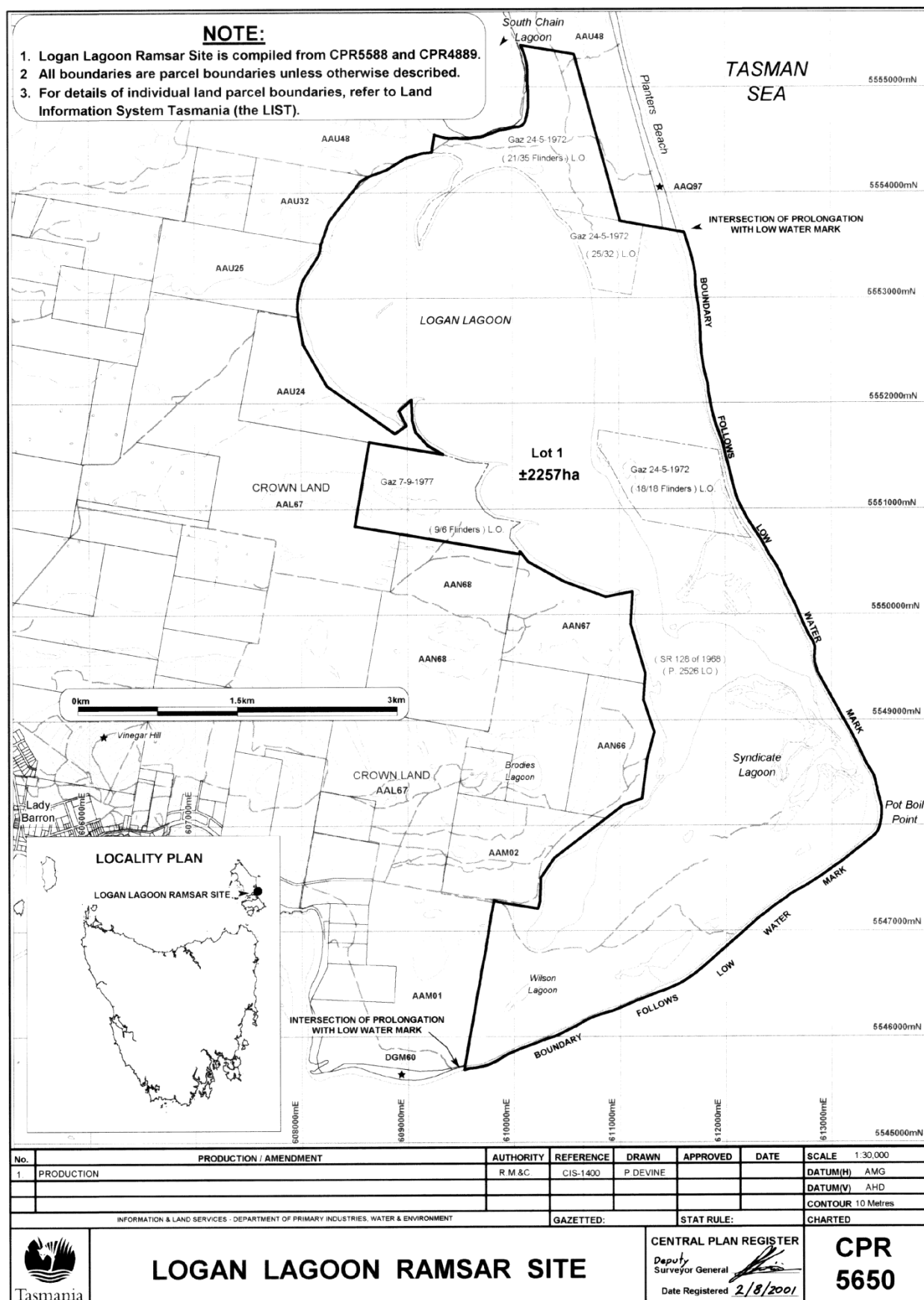


Figure 2: Logan Lagoon Ramsar Site location map

