Ramsar Information Sheet

Published on 26 October 2017
Update version, previously published on : 1 November 2003

Australia

Ord River Floodplain

Designation date	7 June 1990
Site number	477
Coordinates	15°31'13"S 128°19'48"E
Area	140 766,00 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 Ord River Floodplain Ramsar Site is located in the East Kimberley region in the north of Western Australia, within the Ord-Pentecost River Region in the Tanami-Timor Sea Coast Drainage Division. The Ramsar Site was designated in June 1990.

The Ord River Floodplain Ramsar Site is an extensive system of river, seasonal creek, tidal mudflat and floodplain wetlands. The site represents the best example of wetlands associated with the floodplain and estuary of a tropical river system in the Kimberley region of Western Australia. The site includes the False Mouths of the Ord, which comprises vast areas of mudflats, mangrove communities and a maze of tidal creeks. The site also includes small but potentially important freshwater forested swamps. Of the 19 species of mangrove found in Western Australia, 15 have been recorded within the Ramsar Site. The site is also important because of the presence of mangrove dependent bird species and the provision of habitat for the regionally protected Saltwater Crocodile (Crocodylus porosus).

The Ramsar Site is a nursery, feeding and/or breeding ground for migratory birds, waterbirds, fish, crabs, prawns and crocodiles. Over 200 bird species have been recorded within the Site (including 105 waterbird species), over 300 species of vascular plants, 35 reptile species and 17 species of bats. The site supports Freshwater Sawfish (Pristis microdon), Green Sawfish (Pristis zijsron) and the Australian Painted Snipe (Rostratula australis), which are listed as vulnerable under the national 'Environment Protection and Biodiversity Conservation Act 1999'. The site is also one of only two known habitats in Western Australia of the nationally endangered Northern River Shark (Glyphis garricki). The site regularly supports 1% of the population of Plumed Whistling Duck (Dendrocygna eytoni) and Little Curlew (Numenius minutes). A Flatback Turtle (Natator depressus) rookery is located at Cape Domett, immediately north of the Ramsar Site.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Compiler 1

Name	Principal Coordinator, Wetlands Section
Institution/agency	Department of Parks and Wildlife (Western Australia)
Postal address	17 Dick Perry Ave Technology Park Kensington WA 6983 Australia
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2.1.2 - Period of collection of data and information used to compile the RIS

From year	1989
To year	2015

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Ord River Floodplain

2.1.4 - Changes to the boundaries and area of the Site since its designation or earlier update

(Update) A. Changes to Site boundary	Yes ◉ No ○
(Update) The boundary has been delineated more accurately	☑
(Update) The boundary has been extended	☐
(Update) The boundary has been restricted	☐
(Update) B. Changes to Site area	the area has decreased
(Update) The Site area has been calculated more accurately	☑
(Update) The Site has been delineated more accurately	☑
(Update) The Site area has increased because of a boundary extension	☐
(Update) The Site area has decreased because of a boundary restriction	☐

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?	No

2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image

<1 file(s) uploaded>

Former maps	0

Boundaries description

The boundary of the Ramsar Site includes the Parry Lagoons Nature Reserve 42155 and the Ord River Nature Reserve 31967 both of which are vested in the Conservation Commission of Western Australia and managed by the Department of Parks and Wildlife. The Ramsar Site also includes areas of non-reserved marine and estuarine waters of the Cambridge Gulf and the lower Ord River. Excluded from the Ramsar Site is the Parry Creek Road Reserve, Parry Creek Farm and the Goose Hill Living Area.

The boundary of the Ord River Floodplain Ramsar Site includes the following lots: Crown Reserve 42155 (Lot 301 on Plan 47473, Lot 302 on Plan 47473, Lot 745 on Plan 240360, Lot 746 on Plan 240360); Crown Reserve 48482 (Lot 300 on Plan 46802); Crown Reserve 39016 (Lot 621 on Plan 216016); Crown Reserve 34724 (Lot 486 on Plan 182258); Crown Reserve 31967 (Lot 755 on Plan 241648, Lot 671 on Plan 240266); Unallocated Crown Land (PIN 639736, Lot 844 on Plan 194780).

Excluded from the Ramsar site is the Parry Creek Road Reserve, Parry Creek Farm and the Goose Hill Living Area: Freehold (Lot 377 on Plan 180078, Lot 224 on Plan 166136, Lot 223 on Plan 166136, Lot 292 on Plan 173332, Lot 841 on Plan 35244); Road reserve (PIN 639952, Lot 881 on Plan 28405).

Note: Unallocated Crown Land (UCL) refers to Crown land which is not subject to any interest (aside from native title interests) and which is not reserved or dedicated. A Parcel Identifier Number (PIN) is allocated to areas of UCL that do not have a defined cadastral identifier (e.g. lot number). Boundary descriptions including UCL will be revised as more information is available.

2.2.2 - General location

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

b) What is the nearest town or population centre? The site is remote. The nearest town is Wyndham (population 787 in 2011) approximately 10 kilometres west of the site. The capital city of Western Australia is Perth, which is over 3,000 kilometres south of the 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): 140766

Area, in hectares (ha) as calculated from GIS boundaries: 140765.65

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Other scheme (provide name below)	

Other biogeographic regionalisation scheme

The Ord-Pentecost River Region in the Tanami-Timor Sea Coast Drainage Division (Australian Hydrological Geospatial Fabric). The estuary is open to the Northwest Transition of the Integrated Marine and Coastal Regionalisation of Australia – version 4.0 June 2006 (IMCRA v4.0).

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 represents the best example of wetlands associated with the floodplain and estuary of a tropical river system in the Tanami–Timor Sea Coast bioregion in the Kimberley region of Western Australia. In addition, the False Mouths of the Ord are the most extensive mudflat and tidal waterway complex in Western Australia and the wetland grass/herblands at Parry Lagoons are the most extensive vegetation community of this type in the State (Department of Conservation and Land Management 1998). Within the Ramsar Site, as the freshwater floodplain grades into estuarine systems, the line between fresh non-tidal and saline intertidal is not static and there is a broad transitional (ecotonal) zone. The ecotone may at times seem fresh in terms of plants and water quality and at other times saline. The vegetation communities within these sites can vary considerably, for example, from Melaleuca thickets to dense stands of mangrove. This is a dynamic and rich zone for fauna and flora but is poorly known because it is vaguely defined and is almost inaccessible during the wet season (Hale 2008).

☑ Criterion 2 : Rare species and threatened ecological communities

☑ Criterion 3 : Biological diversity

Justification	The Ramsar Site contains 15 of the 19 species of mangrove known to occur in Western Australia (Johnstone 1990; Semeniuk and Semeniuk 2000) and is the most diverse area for mangroves in the Kimberley region and potentially in the State (Pedretti and Paling 2001). Mangroves are the most extensive vegetation community in the Ramsar Site, covering approximately 26,800 hectares. These communities are important habitat for a number of bird species restricted to mangrove forests in Western Australia. Twenty one mangrove bird species have been recorded within the Ramsar Site. The Black Butcherbird (Cracticus quoyi) and Collared Kingfisher (Todiramphus chloris) are significant due to their isolation from other populations of these species. The Black Butcherbird (Cracticus quoyi) breed in the area and is the only population of its kind in Western Australia (Johnstone 1990).

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

☑ Criterion 5 : >20,000 waterbirds

Overall waterbird numbers	>20,000 regularly
Start year	1980
Source of data:	Jaensch and Vervest 1990, Hale 2008, Atlas of Australian Birds (BirdLife Australia)

☑ Criterion 6 : >1% waterbird population

☑ Criterion 8 : Fish spawning grounds, etc.

Justification	The Ramsar Site is important as a nursery and/or breeding and/or feeding ground for at least 50 species of fish and a migratory route for 15 species that are known to be diadromous (i.e. fish species that migrate between salt and freshwater) (Hale 2008).

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

It is not known if there are nationally rare, threatened or endemic plants at the Site. There are several species that are under consideration for declaration as “rare flora” at a State level, notably Utricularia aurea.

The second record for the mangrove species Diospyros littorea in Western Australia is within the Ramsar Site. The species is listed as a priority (P2) flora species in Western Australia.

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

Phylum	Scientific name	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
Birds																		
CHORDATA / AVES	*Anas gracilis*	Grey Teal	☐	☐	☐	☐	☐	☑	☐	☐	6980	1980-1990		LC	☐	☐		Population size is the maximum count of this species recorded from the site (from Jaensch and Vervest 1990). More recent data on population size is not available.
CHORDATA / AVES	*Anas superciliosa*	Pacific Black Duck	☐	☐	☐	☐	☐	☑	☐	☐	1000	1980-1990		LC	☐	☐		Population size is the maximum count of this species recorded from the site (from Jaensch and Vervest 1990). More recent data on population size is not available.
CHORDATA / AVES	*Aythya australis*	Hardhead	☐	☐	☐	☐	☐	☑	☐	☐	4000	1980-1990		LC	☐	☐		Population size is the maximum count of this species recorded from the site (from Jaensch and Vervest 1990). More recent data on population size is not available.
CHORDATA / AVES	*Calidris acuminata*	Sharp-tailed Sandpiper	☐	☑	☐	☐	☐	☑	☐	☐	1500	1980-1990		LC	☐	☐		Population size is the maximum count of this species recorded from the site (from Jaensch and Vervest 1990). More recent data on population size is not available. Data deficient but may support >1%, migratory
CHORDATA / AVES	*Dendrocygna eytoni*	Plumed Whistling Duck	☐	☐	☑	☐	☐	☑	☐	☐	15000	1980-1990	1.5	LC	☐	☐	EPBC Vulnerable	Population size is the maximum count of this species recorded from the site (from Jaensch and Vervest 1990). More recent data on population size is not available.
CHORDATA / AVES	*Erythrogonys cinctus*	Red-kneed Dotterel	☐	☐	☐	☐	☐	☑	☐	☐	3000	1980-1990		LC	☐	☐		Population size is the maximum count of this species recorded from the site (from Jaensch and Vervest 1990). More recent data on population size is not available. Data deficient but may support >1%
CHORDATA / AVES	*Erythrotriorchis radiatus*	Red Goshawk	☑	☐	☐	☐	☐	☐	☐	☐				NT	☐	☐	EPBC Vulnerable	
CHORDATA / AVES	*Erythrura gouldiae*	Gouldian Finch	☑	☐	☐	☐	☐	☐	☐	☐				NT	☐	☐	EPBC Endangered	
CHORDATA / AVES	*Falcunculus frontatus*	Crested Shriketit	☑	☐	☐	☐	☐	☐	☐	☐				LC	☐	☐	EPBC Vulnerable	
CHORDATA / AVES	*Himantopus himantopus*	Black-winged Stilt	☐	☐	☐	☐	☐	☑	☐	☐	1700	1980-1990		LC	☐	☐		Population size is the maximum count of this species recorded from the site (from Jaensch and Vervest 1990). More recent data on population size is not available.
CHORDATA / AVES	*Numenius minutus*	Little Curlew	☐	☑	☑	☐	☐	☐	☐	☐	2500	1980-1990	1.4	LC	☐	☐		Population size is the maximum count of this species recorded from the site (from Jaensch and Vervest 1990). More recent data on population size is not available.
CHORDATA / AVES	*Rostratula australis*	Australian Painted Snipe	☑	☐	☐	☐	☐	☐	☐	☐				EN	☐	☐	EPBC Vulnerable	

Phylum	Scientific name	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
Fish, Mollusc and Crustacea																		
CHORDATA / ACTINOPTERYGII	*Epinephelus lanceolatus*	Queensland groper	☑	☐	☐	☐	☐	☐	☐	☑				VU	☐	☐		
CHORDATA / ELASMOBRANCHII	*Glyphis garricki*	Northern River Shark	☑	☐	☐	☐	☐	☐	☐	☑				CR	☐	☐	EPBC Endangered	One of only two known habitats in Western Australia.
CHORDATA / ELASMOBRANCHII	*Pristis microdon*	Freshwater Sawfish	☑	☑	☐	☐	☐	☐	☐	☑				CR	☑	☐	EPBC Vulnerable	Migratory
CHORDATA / ELASMOBRANCHII	*Pristis zijsron*	Green Sawfish	☑	☑	☐	☐	☐	☐	☐	☑				CR	☑	☐	EPBC Vulnerable	Migratory
Others																		
CHORDATA / MAMMALIA	*Dasyurus hallucatus*	Northern Quoll	☑	☐	☐	☐	☐	☐	☐	☐				EN	☐	☐	EPBC Endangered	
CHORDATA / REPTILIA	*Natator depressus*	Flatback Turtle	☑	☐	☐	☐	☐	☐	☐	☐					☑	☐	EPBC Vulnerable	A Flatback Turtle rookery is located at Cape Domett, immediately north of the Ramsar site. Highly likely that the species is also found within the northern boundary of the Ramsar site.

1) Percentage of the total biogeographic population at the site

The site is remote and comprises extensive and diverse habitats that are largely inaccessible during the wet season. With increased survey efforts and monitoring, it is likely that additional species of international importance will be recorded.

The site meets Criterion 4 by supporting animals during:
• critical life stages of migration – annual use by large numbers of fish and migratory birds (32 bird species listed under international migratory agreements). Further information is available in Hale (2008).
• critical life stage of drought refuge – seasonal influx of large numbers of waterbirds from dry wetlands in surrounding areas and periodic massive influx from wider areas during drought
• critical life stage of breeding – 16 species of wetland dependent birds, Saltwater and Freshwater Crocodiles and an unknown number of fish species. Further information is available in Hale (2008).

Overall waterbird numbers:
The site is extensive, very remote and at the time of greatest waterbird habitat and food resources (the wet season) access to wetlands to survey birds is extremely difficult. As such, few waterbird surveys have been undertaken within the Ramsar Site and when conducted, surveys are limited only to accessible areas. The most comprehensive waterbird surveys were conducted in the 1980s, however, they were limited to Parry Lagoons. More recent surveys at Parry Lagoons by BirdLife Australia members (1998-2013) were undertaken during the dry season and were largely presence/absence observations with little quantitative data. Observational data from the BirdLife Australia surveys indicates that waterbird species composition has remained relatively stable from 1998 to 2013. The paucity of waterbird surveys within the Ramsar site has been acknowledged as a knowledge gap in the ecological character description (Hale 2008). As the ecological character of the site has not changed since the surveys in the 1980s, it would be expected that the criterion of 'regularly supports 20,000 waterbirds' is still supported. Surveys from Parry Lagoons only (March 1980 – 20,000; March 1983 – >20,000; May 1986 – 20,670; May 1988 – 18,914).

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

<no data available>

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

4.1 - Ecological character

Climate
Semi-arid monsoonal. Annual average rainfall at Wyndham (1968-2014) is 820 mm with high annual variation (460 to 1,620 mm) (Bureau of Meteorology 2014). Rain falls mostly in the wet season (November-April).

Geomorphology
Extensive mud flats, intertidal areas and floodplain (seasonal and permanent freshwater wetlands) provide habitat for mangroves, invertebrates and waterbirds.

Hydrology
Macro-tidal influence. Dams upstream have reduced inflows (Trayler et al. 2006). Low flows occur during the dry season with higher flows in the wet. Overbank flows from the Ord River to Parry Lagoons are now infrequent. Parry Creek is the major source of water for Parry Lagoons and floodplains.

Water quality
Estuary is highly turbid and net exporter of nutrients. Potentially high nutrient levels from upstream agriculture. Salinity in the estuary varies seasonally (30–35 ppt in dry, < 4 ppt in wet). Parry Lagoons is predominantly fresh. Some agrichemicals detected above ANZECC guidelines (Water and Rivers Commission 2003a).

Phytoplankton
Estuary dominated by diatoms and plankton, and is predominantly epi-benthic.

Vegetation
More than 300 species of vascular plants recorded. Extensive areas of mangrove in intertidal areas with 15 species recorded. Parry Lagoons supports extensive sedge/grass lands (intermittent inundation); aquatic vegetation occurs in the permanent waterholes surrounded by wooded swamp.

Invertebrates
Commercially significant taxa include mud crabs and white banana prawns.

Fish
More than 50 species (estuarine, marine and freshwater). Migratory route for approximately 15 species. Supports nationally listed species: Freshwater Sawfish (Pristis microdon), Green Sawfish (Pristis zijsron) and Northern River Shark (Glyphis garricki) (Morgan et al. 2011).

Birds
Over 200 species recorded within the site, including nationally listed species and the only known site in WA of Zitting Cisticolas (Cisticola juncidus). Breeding recorded for 16 species (Hale 2008). Site supports extensive and diverse nesting habitats (Department of Environment and Conservation 2012).

Reptiles
35 species recorded. Regionally protected Saltwater (Crocodylus porosus) and Freshwater crocodiles (Crocodylus johnstoni) occur and breed within the site.

Mammals
Supports nationally listed Northern Quoll (Dasyurus hallucatus), 17 bat species and at least 36 other mammal species (Department of Environment and Conservation 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
F: Estuarine waters		0		Representative
G: Intertidal mud, sand or salt flats		0		Representative
H: Intertidal marshes		0		Representative
I: Intertidal forested wetlands		0		Representative
J: Coastal brackish / saline lagoons		0		Representative
K: Coastal freshwater lagoons		0		Representative

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		0		Representative
Fresh water > Flowing water >> N: Seasonal/ intermittent/ irregular rivers/ streams/ creeks		0		Representative
Fresh water > Lakes and pools >> Tp: Permanent freshwater marshes/ pools		0		Representative
Fresh water > Marshes on inorganic soils >> Ts: Seasonal/ intermittent freshwater marshes/ pools on inorganic soils		0		Representative
Fresh water > Marshes on inorganic soils >> W: Shrub-dominated wetlands		0		Representative
Fresh water > Marshes on inorganic soils >> Xf: Freshwater, tree-dominated wetlands		0		Representative
Fresh water > Flowing water >> Y: Permanent Freshwater springs; oases		0		Representative

Other non-wetland habitat

Other non-wetland habitats within the site	Area (ha) if known
Grassland	
Low woodland (divided into 7 associations)	
Dune systems	
Sandstone range open woodland	
Rainforest (aquifer forest)	
Savannah woodland	

(ECD) Habitat connectivity	The freshwater floodplain (Parry Lagoons) grades into the estuarine (Ord Estuary) and marine (False Mouths of the Ord) influenced habitats. The habitats are directly related to the hydrological connectivity between fresh, estuarine and marine waters.

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Scientific name	Common name	Position in range / endemism / other
Echinochloa kimberleyensis	null	Poorly known and likely to have a high degree of endemism.
Goodenia brachypoda	null	Poorly known and likely to have a high degree of endemism.
Nymphaea immutabilis	null	Poorly known and likely to have a high degree of endemism.
Paspalidium distans	null	Poorly known and likely to have a high degree of endemism.
Psilotum nudum	null	Poorly known and likely to have a high degree of endemism.
Utricularia aurea	null	Poorly known and likely to have a high degree of endemism.
Utricularia stellaris	null	Poorly known and likely to have a high degree of endemism.

Invasive alien plant species

Scientific name	Common name	Impacts	Changes at RIS update
Calotropis procera	Rubber bush	Actually (minor impacts)	unknown
Hyptis suaveolens	Hyptis	Actually (minor impacts)	unknown
Jatropha gossypiifolia	Bellyache bush	Actually (minor impacts)	unknown
Mimosa pigra	Mimosa	Actually (minor impacts)	unknown
Parkinsonia aculeata	Parkinsonia	Actually (minor impacts)	unknown
Passiflora foetida	Wild passionfruit	Actually (minor impacts)	unknown
Xanthium strumarium	Noogoora burr	Actually (minor impacts)	unknown

4.3.2 - Animal species

Other noteworthy animal species

Phylum	Scientific name	Common name	Pop. size	Period of pop. est.	%occurrence	Position in range /endemism/other
CHORDATA/AVES	Cisticola juncidis	Zitting Cisticola				Only known site in Western Australia where Zitting Cisticolas occur and breed. Parry Lagoons is the western extent of the species range (they are common in Queensland and the Northern Territory).
CHORDATA/AVES	Cracticus quoyi	Black Butcherbird				Mangrove dependent species, likely to be highly endemic due to distance from other populations.
CHORDATA/AVES	Todiramphus chloris	Collared Kingfisher				Mangrove dependent species, likely to be highly endemic due to distance from other populations.
ARTHROPODA/MALACOSTRACA	Fenneropenaeus indicus	Red-legged Banana Prawn				Significant numbers of post-larval and juvenile Red-Legged Banana Prawns in 1998 surveys. The Ramsar site is important for maintaining stocks of this commercial species and as a food source for migratory species.
ARTHROPODA/MALACOSTRACA	Fenneropenaeus merguiensis	White Banana Prawn				Possibly also commercially significant, and as a food source for migratory species.
CHORDATA/MAMMALIA	Chaerephon jobensis	Northern mastiff bat				
CHORDATA/REPTILIA	Crocodylus johnsoni	Freshwater Crocodile	400			Endemic to Australia. Regionally protected due to impacts of hunting.
CHORDATA/REPTILIA	Crocodylus porosus	Saltwater Crocodile	80			Regionally protected due to impacts of hunting.
CHORDATA/MAMMALIA	Pteropus alecto	Black flying fox				

Invasive alien animal species

Phylum	Scientific name	Common name	Impacts	Changes at RIS update
ARTHROPODA/MALACOSTRACA	Cherax quadricarinatus	Redclaw crayfish	Potentially	unknown
ARTHROPODA/INSECTA	Apis mellifera	Honey Bee	Actually (minor impacts)	unknown
CHORDATA/MAMMALIA	Bos taurus	Domestic Cattle (feral)	Actually (minor impacts)	No change
CHORDATA/MAMMALIA	Felis catus	Domestic Cat	Potentially	unknown
CHORDATA/AMPHIBIA	Rhinella marina	Cane Toad	Actually (major impacts)	increase
CHORDATA/MAMMALIA	Sus scrofa	Pig (feral)	Potentially	unknown

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
A: Tropical humid climate	Aw: Tropical savanna (Winter dry season)

An increasing trend in annual rainfall has been recorded as a result of higher summer rains and drier spring periods, effectively intensifying the Wet-Dry tropical climate in the region (Gehrke 2009). Changes in sea level may result in increased inundation of tidal flats and low-lying estuarine areas, and increased saline intrusion upstream during low flow periods (Gehrke 2009). Increased global air temperatures may cause some warming of aquatic habitats in the lower Ord River and estuary, which is likely to be more pronounced in shallow wetlands and intertidal habitats (Gehrke 2009).

4.4.2 - Geomorphic setting

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

a) Maximum elevation above sea level (in metres): 350

- 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.

Ord River / Timor Sea

4.4.3 - Soil

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

The majority of the Ramsar Site comprises alluvium and coastal silt/ evaporite deposits of Quaternary origin. However, the area surrounding Parry Lagoons is comprised of black soils also formed in the Quaternary.

4.4.4 - Water regime

Water permanence

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

Source of water that maintains character of the site

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

The floodplain of the lower Ord River is a complex network of intermittent (and occasionally permanent) streams. The major sources of freshwater directly into the site are from the Ord River itself, Parry Creek (into Parry Lagoons) and the major tributaries of the False Mouths of the Ord; Emu, Tanamurra and Station Creeks.

Large floods occur predominantly in the wet season, however, median flows are only slightly greater in the wet than the dry season, as constant releases from the Ord River Dam over the dry season ensure that the river is a permanent system. Peak flows in the lower Ord River are now predominantly governed by inflows from the unregulated Dunham River and localised catchments. It is only during very wet years that releases from the dams contribute to flood flows. These flood flows are important for a number of reasons including inundation of Parry Lagoons as well as for flushing the estuary and removing the build-up of deposited silt.

(ECD) Connectivity of surface waters and of groundwater	During the wet season, surface waters from the floodplain flow into the estuary towards the ocean. With the exception of Parry Lagoons, the majority of the site is tidally influenced. Groundwater flows to the lower Ord have not been quantified.
(ECD) Stratification and mixing regime	No information available.

4.4.5 - Sediment regime

Significant accretion or deposition of sediments occurs on the site ☑

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

Significant transportation of sediments occurs on or through the site ☑

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

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

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

Sediment regime unknown ☐

Please provide further information on sediment (optional):

The Ord River Estuary is characterised by high total suspended sediments, which influence light penetration and turbidity. The suspended solid concentrations are predominantly a result of tidal re-suspension of fine sediments that have accumulated in the estuary and channel (Wolanski et al. 2001). Suspended sediment concentrations are lower in the freshwater sections of the river and are typically <100 mg/L (Wolanski et al. 2001; Parslow et al. 2003). Suspended sediment concentrations are highest in the mid-estuary section with maximum values of between 4,000-5,000 mg/L recorded (Wolanski et al. 2001; Parslow et al. 2003). In the more open estuary areas, suspended sediment concentrations are lower and typically < 500 mg/L.

(ECD) Water turbidity and colour: Turbidity is high in the estuary due to the constant resuspension of accumulated sediments.

(ECD) Light - reaching wetland: Light penetration is reduced in the estuary due to high suspended sediments concentrations.

(ECD) Water temperature: No information available.

4.4.6 - Water pH

Unknown ☑

Please provide further information on pH (optional):

pH is acknowledged in the ecological character description as a knowledge gap (Hale 2008).

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):

The estuarine areas around the False Mouths of the Ord, except following heavy local rainfall, are typically saline with salinities between 32 and 36 ppt (Kenyon et al. 2004). However, in the East Arm of the Ord Estuary, the constant freshwater inflows affect the seasonal patterns of salinity. During the dry season, salinity may be approximately 28–32 ppt, but during the wet season this can drop to < 4 ppt (Parslow et al. 2003; Kenyon et al. 2004). Further inland, water in the river is mostly fresh with salinities of < 4 ppt year round (Parslow et al. 2003). There are few data for Parry Lagoons, however, over two seasons salinity ranged from < 1 ppt during the wet season to 1–4 ppt during the dry season (Water and Rivers Commission 2003b).

(ECD) Dissolved gases in water

The system is well oxygenated with dissolved oxygen concentrations between 6 and 8 ppt and 90-110% saturation.

4.4.8 - Dissolved or suspended nutrients in water

Mesotrophic ☑

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

Unknown ☐

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

Total nitrogen concentrations ranged from < 300 g/L to > 2,000 g/L and total phosphorous concentrations from < 40 g/L to > 400 g/L. Nutrient concentrations were correlated with suspended sediment concentrations. Highest concentrations were recorded in the mid-estuary during the dry season, while concentrations in the upper estuary and the outer open estuary were typically lower. Highest nitrate-nitrite concentrations (> 200 g/L) occurred at the downstream open estuary section. Concentrations of nitrate-nitrite in the upper estuary were < 100 g/L and most often < 50 g/L. Phosphate concentrations were highest downstream (up to 40 g/L) and lowest in the upper estuary (15–20 g/L). Nutrient concentrations in Parry Lagoons are not known. Given that the water source is now predominantly from the Parry Creek Catchment, which does not have irrigated agriculture influences, it is possible that nutrient concentrations are lower than those in the Ord Estuary.

(ECD) Dissolved organic carbon: No information available.

(ECD) Redox potential of water and sediments: No information available.

(ECD) Water conductivity: No information available.

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 ☐

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)	High

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Recreational hunting and fishing	Medium
Recreation and tourism	Picnics, outings, touring	Medium
Recreation and tourism	Nature observation and nature-based tourism	Medium
Spiritual and inspirational	Cultural heritage (historical and archaeological)	High
Spiritual and inspirational	Contemporary cultural significance, including for arts and creative inspiration, and including existence values	High
Spiritual and inspirational	Spiritual and religious values	High
Spiritual and inspirational	Aesthetic and sense of place values	High
Spiritual and inspirational	Inspiration	High
Scientific and educational	Educational activities and opportunities	Medium
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	High
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
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	Medium

Other ecosystem service(s) not included above:

More information on ecosystem services:
Provisioning services
Wetland products: commercial fisheries for a number of species of fish, as well as prawns and crabs.

Regulating services
Erosion control: the mangroves of the estuary protect the coast from erosion.

Supporting services
Nutrient cycling: the Ord River Floodplain plays a role in nutrient cycling, but its significance beyond the site is not known.
Biodiversity: the system provides a wide range of biodiversity related ecological services critical for the ecological character of the site.

Outside the site: 1,000s

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

4.5.2 - Social and cultural values

i) the site provides a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland ☐

ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland ☐

iii) the ecological character of the wetland depends on its interaction with local communities or indigenous peoples ☐

iv) relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland ☐

<no data available>

4.6 - Ecological processes

(ECD) Primary production	The Ramsar site is driven by phytoplankton/microphytobenthos primary production. High phytoplankton productivity is linked to increased dissolved oxygen concentrations.
(ECD) Nutrient cycling	The site is a net exporter of nutrients to the ocean with exports higher in the wet season. Nutrient inflows from the catchment maintain productivity, however, high nutrient loads from agriculture may overload the capacity of the system to cycle nutrients
(ECD) Carbon cycling	Inundation of the floodplain during the wet season mobilises organic carbon from vegetated debris into a dissolved mineralised form. This provides an organic carbon source for the river and estuary and stimulates productivity.

(ECD) Animal reproductive productivity	A food web is provided in the ecological character description (Hale 2008).
(ECD) Vegetational productivity, pollination, regeneration processes, succession, role of fire, etc.	A food web is provided in the ecological character description (Hale 2008).
(ECD) Notable species interactions, including grazing, predation, competition, diseases and pathogens	Cane toads pose the greatest threat from an introduced species and can impact wildlife by poisoning, predation and competition. The 'Cane toad strategy for Western Australia 2014-2019' is being implemented.
(ECD) Notable aspects concerning animal and plant dispersal	Mangrove extent is approximately 26,000 ha. Distribution of other flora requires survey work. Distribution and population estimates of fauna requires survey work.
(ECD) Notable aspects concerning migration	Onset of the wet season triggers migration of fish and bird species, within and into the Ramsar site. Inundation of the floodplain and intertidal areas is critical to provide habitat and drive the high productivity required to support migratory species.
(ECD) Pressures and trends concerning any of the above, and/or concerning ecosystem integrity	Upstream agricultural activities have the potential to impact the hydrology and water quality of the site.

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 majority of the land surrounding the Ramsar Site is Crown Land and a large area of that is leased and utilised for agriculture.

5.1.2 - Management authority

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

Department of Parks and Wildlife
Lot 248 Ivanhoe Road
Kununurra WA 6743.

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

District Manager, East Kimberley District.

Postal address:

PO Box 942
Kununurra WA 6743

E-mail address:

wetlands@dpaw.wa.gov.au

5.2 - Ecological character threats and responses (Management)

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

Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Canalisation and river regulation	High impact		☐	No change	☑	No change

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Livestock farming and ranching	Medium impact		☐	No change	☑	unknown
Annual and perennial non-timber crops		Medium impact	☐	No change	☑	unknown

Energy production and mining

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Mining and quarrying		Low impact	☑	increase	☐	No change

Biological resource use

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

Natural system modifications

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

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Agricultural and forestry effluents		High 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
Unspecified		High impact	☑	unknown	☑	unknown

Please describe any other threats (optional):

More information on threats:
The threat level from the factors relating to water regulation may increase due to future development of the Ord Stage 2 proposal.

High levels of agrichemicals (pesticides) have been linked to fish kills and there is evidence of bioaccumulation of DDT in Barramundi and Freshwater Crocodiles (Morrissey 2000; Yoshikane et al. 2006).

Dams upstream in the Ord River (Lakes Argyle and Kununurra Ramsar site) have reduced the inflows to the Ord River Floodplain Ramsar Site (Trayler et al. 2006). These dams maintain a supply of water for irrigation and hydroelectric power.

5.2.2 - Legal conservation status

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
State Protected Area (WA)	Ord River and Parry Lagoons Nature Reserves		partly

5.2.3 - IUCN protected areas categories (2008)

Ia Strict Nature Reserve ☑

Ib Wilderness Area: protected area managed mainly for wilderness protection ☐

II National Park: protected area managed mainly for ecosystem protection and recreation ☐

III Natural Monument: protected area managed mainly for conservation of specific natural features ☐

IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention ☐

V Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation ☐

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

5.2.4 - Key conservation measures

Legal protection

Measures	Status
Legal protection	Implemented

Species

Measures	Status
Control of invasive alien plants	Implemented
Control of invasive alien animals	Implemented

Human Activities

Measures	Status
Management of water abstraction/takes	Implemented
Livestock management/exclusion (excluding fisheries)	Partially implemented
Fisheries management/regulation	Implemented
Communication, education, and participation and awareness activities	Implemented
Research	Partially implemented
Regulation/management of recreational activities	Implemented

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 ◉

Please indicate if a Ramsar centre, other educational or visitor facility, or an educational or visitor programme is associated with the site:

Walkways and bird viewing platforms have been constructed at Marglu Billabong within Parry Lagoons. Interpretive signs about the site were installed during 1998-99.

URL of site-related webpage (if relevant): http://www.environment.gov.au/cgi-bin/wetlands/ramsardetails.pl?refcode=31

5.2.6 - Planning for restoration

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

5.2.7 - Monitoring implemented or proposed

The Department of Water has an extensive monitoring network within and upstream of the catchment area. Surface and groundwater are monitored along with some rainfall gauging stations. The department has a Water Information Reporting tool available on its website that includes measurement information and data for numerous locations within the Ramsar Site.
Link to Water Information Reporting tool http://wir.water.wa.gov.au/SitePages/SiteExplorer.aspx

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

Due to space limitations the Reference list is included as an attachment under 6.1.2.

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)
<no file available>

ii. a detailed Ecological Character Description (ECD) (in a national format)
<1 file(s) uploaded>

iii. a description of the site in a national or regional wetland inventory
<no file available>

iv. relevant Article 3.2 reports
<no file available>

v. site management plan
<1 file(s) uploaded>

vi. other published literature
<1 file(s) uploaded>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:

Parry Lagoons (*Glen Daniel, 2008*)

Ord River Floodplain (*Michelle McAulay, 2009*)

False Mouths of the Ord (*KimBrennan, 2009*)

6.1.4 - Designation letter and related data

Designation letter
<1 file(s) uploaded>

Date of Designation: 1990-06-07