

3 RESULTS

3.1 Wetland Status

For the purpose of this report, the term 'wetland status' refers to information that describes the number, extent and tenure arrangements for Australia's Ramsar estate. Wetland status was considered by grouping wetlands according to a number of administrative and environmental features, namely:

- Administrative boundaries and management unit divisions. For the purpose of this report, emphasis has been placed on reporting wetland status at the State/Territory (and in the case of external territories, the Commonwealth) level. Note also that wetlands that are jointly managed by the State and Commonwealth were considered as a separate category.
- Rationalised delineation of wetlands based on (*a priori*) grouping of wetlands, based on broad-scale environmental characteristics of the landscape in which the wetland is located. For the purpose of this report, wetland regionalisation has been considered at the following levels:
 - Catchment and basin divisions (i.e. drainage divisions and sub-basins);
 - Biogeographical regions (i.e. IMCRA, IBRA);
- The environmental characteristics within the wetland. This considers the geological, physio-chemical, hydrological and ecological characteristics of the wetland. For the purposes of this study, the Ramsar wetland classification system has been used to differentiate wetland types.

3.1.1 Number of Ramsar Sites

General

At the time of report preparation (commencing August 2007), there were 64 declared Ramsar sites within Australia and its external territories, and an additional proposed nomination (Paroo River Wetlands) (Table 3-1, Table 3-2) which has since been included as a Ramsar site. At an international scale, this represents approximately 85% of the total number of Ramsar sites in the Oceania Ramsar region², and 3.8% of sites worldwide. The total area of Australian Ramsar estate represents approximately 5% of the total worldwide extent of Ramsar listed wetlands. Australia has the third highest number of Ramsar sites in the world.

Cobourg Peninsula (site 1), located in the Northern Territory, was the first Ramsar site declared in the world (in 1974). Cobourg Peninsula remained the only Ramsar-listed wetland site in Australia between 1974 and 1979, and an additional site was listed in 1980 (Figure 3-1). Twenty new sites were listed in 1982, and since that time there have been several notable peaks in the number of wetlands declared including 1990 (10 sites), 1996 (7 sites) and 2002 (6 sites).

² Australia lies within the Oceania Ramsar region, which include countries such as the Marshall Islands, New Zealand, Palau, Papua New Guinea and Samoa.

Table 3-1 Summary of Australian Ramsar wetlands

Site no.	Wetland Name	Location	Wetland Type	Drainage Division	IBRA/IMCRA	Area (ha)
1	Cobourg Peninsula	NT	Marine & Inland	VIII Timor	TEC	220,700
2	Kakadu National Park (Stage I) incl. wetland components of Stage III	NT (Cwth)	Marine, Inland & Human	VIII Timor	PCA	683,000
3	Moulting Lagoon	TAS	Marine & Inland	III Tas.	FRE	4,507
4	Logan Lagoon	TAS	Marine & Inland	III Tas.	FUR	2,257
5	Lavinia	TAS	Marine & Inland	III Tas.	WOO	7,034
6	Pittwater-Orielton Lagoon	TAS	Marine & Inland	III Tas.	TM	3,334
7	Apsley Marshes	TAS	Marine & Inland	III Tas.	FRE	880
8	East Coast Cape Barren Is Lagoons	TAS	Marine	III Tas.	DE	4,473
9	Flood Plain Lower Ringarooma River	TAS	Marine & Inland	III Tas.	BEN	3,519
10	Jocks Lagoon	TAS	Marine & Inland	III Tas.	BEN	19
11	Interlaken	TAS	Inland	III Tas.	CH	517
12	Little Waterhouse Lake	TAS	Marine & Inland	III Tas.	BEN	56
13	Corner Inlet	VIC	Marine	II SE Coast	SCP	67,186
14	Barmah Forest	VIC	Inland	IV Murray-Darling	RIV	28,515
15	Gunbower Forest	VIC	Inland	IV Murray-Darling	RIV	19,931
16	Hattah-Kulkyne Lakes	VIC	Inland	IV Murray-Darling	MDD	955
17	Kerang Wetlands	VIC	Inland	IV Murray-Darling	RIV	9,419
18	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	VIC	MIH [#]	II SE Coast	SCP	22,897
19	Western Port	VIC	Marine	II SE Coast	SCP	59,297
20	Western District Lakes	VIC	Inland	II SE Coast	VVP	32,898
21	Gippsland Lakes	VIC	Marine & Inland	II SE Coast	SCP	60,015
22	Lake Albacutya	VIC	Inland	IV Murray-Darling	MDD	5,731
23	Towra Point Nature Reserve	NSW	Marine	II SE Coast	SB	386
24	Hunter Estuary Wetlands	NSW	MIH [#]	II SE Coast	SB	2,971
25	The Coorong, and Lakes Alexandrina and Albert Wetland	SA	MIH [#]	IV Murray-Darling	NCP	140,500
26	Bool and Hacks Lagoon	SA	Inland	II SE Coast	NCP	3,200
27	Coongie Lakes	SA	Inland	X Lake Eyre	CHC	1,980,000
28	The Macquarie Marshes	NSW	Inland	IV Murray-Darling	DRP	18,726
29	'Riverland'	SA	Inland	IV Murray-Darling	MDD	30,600
30	Kakadu National Park (Stage II)	NT (Cwth)	Marine & Inland	VIII Timor	PCA	692,940
31	Ord River Floodplain	WA	Marine & Inland	VIII Timor	VB	141,453
32	Lakes Argyle and Kununurra	WA	Inland & Human-made	VIII Timor	VB	117,495

Site no.	Wetland Name	Location	Wetland Type	Drainage Division	IBRA/IMCRA	Area (ha)
33	Roebuck Bay	WA	Marine	XII W. Plateau	DL	34,119
34	Eighty-mile Beach	WA	Marine & Inland	XII W. Plateau	DL	175,487
35	Forrestdale and Thomsons Lakes	WA	Inland	VI SW Coast	SWA	754
36	Peel-Yalgorup system	WA	Marine & Inland	VI SW Coast	SWA	26,530
37	Toolibin Lake	WA	Inland	VI SW Coast	AW	493
38	Vasse-Wonnerup System	WA	Marine & Inland	VI SW Coast	SWA	1,115
39	Lake Warden system	WA	Marine & Inland	VI SW Coast	ESP	2,300
40	Hosnie's Spring (Christmas Island)	EXT (Cwth)	Inland	N/A	N/A	0.13
41	Moreton Bay	QLD	MIH [#]	I NE Coast	SEQ	113,314
42	Bowling Green Bay	QLD	MIH [#]	I NE Coast	BBN	35,500
43	Currawinya Lakes (Currawinya National Park)	QLD	Inland	IV Murray-Darling	ML	151,300
44	Shoalwater & Corio Bays Area (Shoalwater Bay Training Area, Corio Bay)	QLD/ Cwth	Marine	I NE Coast	CHC	239,100
45	Ginini Flats Wetland Complex	ACT	Inland	IV Murray-Darling	AA	343
46	Pulu Keeling National Park (North Keeling Island)	EXT (Cwth)	Marine	N/A	SunP(a)	122
47	Little Llangothlin Nature Reserve	NSW	Inland	II SE Coast	NET	258
48	Blue Lake	NSW	Inland	II SE Coast	AA	320
49	Lake Pinaroo (Fort Grey Basin)	NSW	Inland	X Lake Eyre	SSD	800
50	Gwydir Wetlands: Gingham and Lower Gwydir (Big Leather) Watercourses	NSW	Inland	IV Murray-Darling	DRP	823
51	Great Sandy Strait (including Great Sandy Strait, Tin Can Bay & Inlet).	QLD	Marine & Inland	I NE Coast	SEQ	93,160
52	Myall Lakes	NSW	Marine	II SE Coast	NNC	44,612
53	Narran Lake Nature Reserve	NSW	Inland	IV Murray-Darling	DRP	5,531
54	Becher Point Wetlands	WA	Inland	VI SW Coast	SWA	677
55	Lake Gore	WA	Inland	VI SW Coast	ESP	4,017
56	Muir-Byenup System	WA	Inland	VI SW Coast	JF	10,631
57	Edithvale-Seafood Wetlands	VIC	Inland	II SE Coast	SCP	261
58	Ashmore Reef National Nature Reserve	EXT (Cwth)	Marine	N/A	OSS	58,300
59	Coral Sea Reserves (Coringa-Herald and Lihou Reefs and Cays)	EXT (Cwth)	Marine	N/A	Group 16	1,729,200
60	Elizabeth and Middleton Reefs Marine National Nature Reserve	EXT (Cwth)	Marine	N/A	Norf P(B)	188,000
61	The Dales, Christmas Island	EXT (Cwth)	Marine & Inland	Christmas Is. Indian Ocean	SunP(b)	57
62	Fivebough and Tuckerbil Swamps	NSW	Inland	IV Murray-Darling	RIV	689
63	Banrock Station Wetland Complex	SA	Inland	IV Murray-Darling	MDD	1375
64	NSW Central Murray State Forests	NSW	Inland	IV Murray-Darling	RIV	84,028
65	Paroo River Wetlands*	NSW	Inland	IV Murray-Darling	ML	138,304
Total						7,506,931

N/A = not applicable.

* Please note that the Paroo River Wetlands have not been included in all analyses contained in the report.

Wetland contains marine, inland and human-made components.

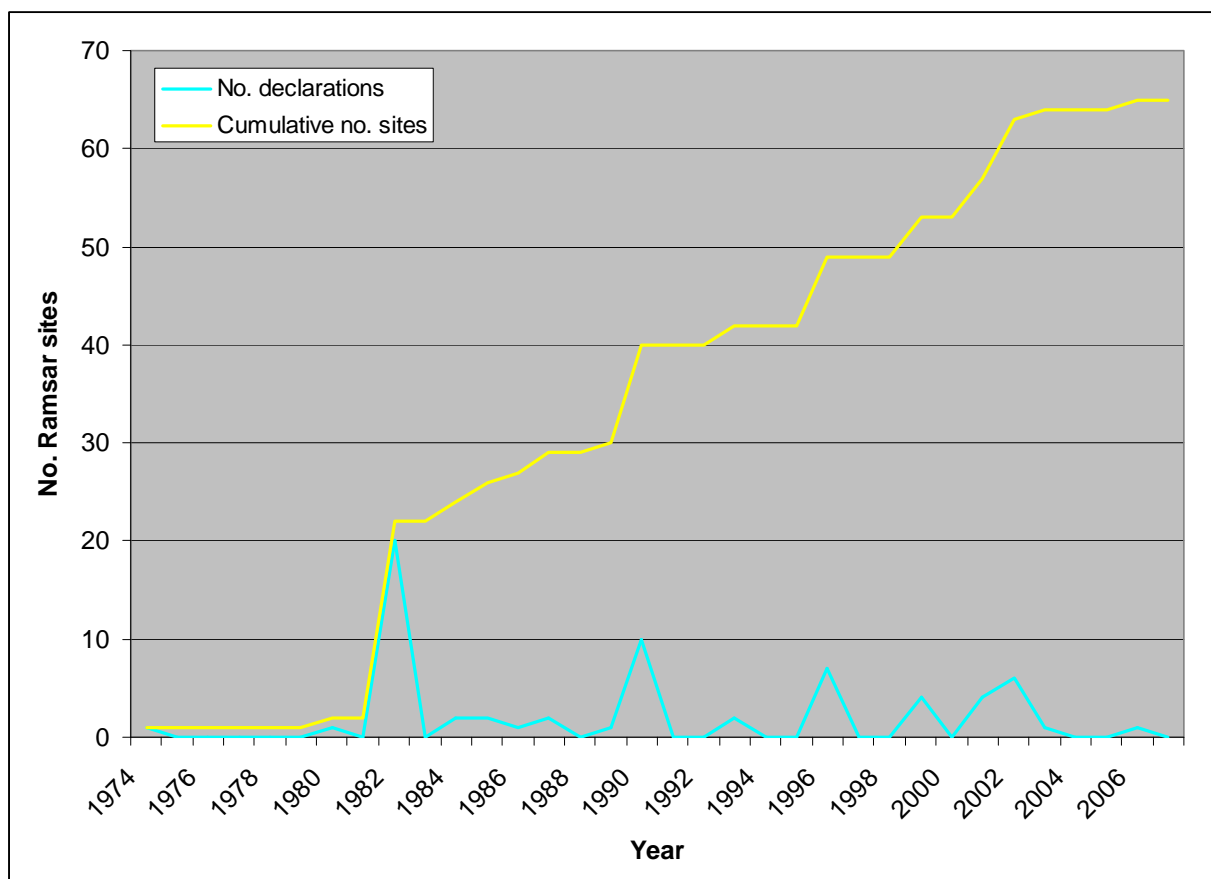


Figure 3-1 Cumulative and total number of Ramsar listed sites in Australia and its external territories since 1974

Table 3-2 Number and area of Ramsar sites within Australia and its external territories

Jurisdiction	Ramsar		National Importance ¹	
	No. of Sites (Cwth)	Area (ha)	No. of Sites (Cwth)	Area (ha)
Australian Capital Territory	1	343	13 (0)	1,257
New South Wales	11	159,144	178 (6)	2,334,734
Northern Territory	3 (2)	1,596,640	33 (4)	4,033,230
Queensland	5 (1)	632,374	181 (8)	42,875,159
South Australia	5	2,155,675	69 (1)	4,223,988
Tasmania	10	26,596	89 (0)	51,514
Victoria	11	307,105	159 (4)	557,888
Western Australia	12	515,071	120 (8)	2,583,325
External Territories	6 (6)	1,975,679	9 (9)	1,168,427
Total	64*	7,368,627*	851 (40)	57,829,522

Note: Number of sites under Commonwealth jurisdiction is shown in parentheses.

¹ = Directory of Nationally Significant Wetlands (3rd Edition) figure as at 2001 (Environment Australia 2001).

* Excludes site 65.

Number of Ramsar Wetlands Within States/Territories

Approximately 69% of the Ramsar sites are located within four states/territories: 12 sites in WA, 11 sites in each of Victoria and NSW, and 10 sites in Tasmania. There are a total of six sites in external territories, and despite containing the largest proportion of nationally significant wetland sites, Queensland is ranked sixth (jointly with South Australia) with five sites. Northern Territory (3 sites) and ACT (1 site) had the least number of Ramsar sites.

Most sites are managed by the state/territory in which they are located. Three of the Commonwealth sites (site 2 Kakadu National Park (Stage 1); Site 30 Kakadu National Park (Stage 2); and Site 44 Shoalwater and Corio Bay) are jointly managed³ with the state/territory in which the wetlands are located. Note that the following analyses examine jointly managed, state/territory managed and Commonwealth managed separately.

Number of Wetlands within IBRA or IMCRA Regions

Ramsar Convention Resolution VI.5 and VII.11 (and Wetlands International 2006) outlines nine criteria for the listing of wetlands of International Importance (Ramsar wetlands). The first criterion (Criterion 1) states “A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.” The inclusion of representative examples of ecosystems and habitats in protected areas is also a key principle underpinning the management of Australia’s protected area networks (e.g. NRS, National Representative System of Marine Protected Areas). Consideration of the number (and extent) of Ramsar wetlands represented in meso-scale bioregions is basic information for inventory and other managerial purposes.

There are 85 IBRA⁴ bioregions (Version 6.1) in Australia and its external territories, of which 30 bioregions are presently represented in Ramsar estate (Table 3-3). The IBRA bioregions with the largest number of Ramsar wetlands were the Riverine (RIV) and South East Coastal Plain (SCP) bioregions (i.e. 5 sites each), followed by Murray-Darling Depression (MDD) and Swan Coastal Plain (SWA) (4 sites each), and Ben Lomond (BEN) and Darling Riverine Plains (DRP) (3 sites each). Ten IBRA bioregions had 2 Ramsar sites, and 14 IBRA bioregions were represented in a single Ramsar site.

Note that IBRAs do not apply to offshore reefs and islands; hence the IMCRA⁵ classification was used for these wetlands. Two sites were located within Sundra Province (b), whereas the remaining 4 IMCRA bioregions incorporated a single site. Maps of IBRA and IMCRA bioregions are included in Appendix G.

³ If the site is located within a Commonwealth Reserve, the Commonwealth together with the State/Territory work corporately to prepare and implement a management plan.

⁴ Interim Biogeographic Regionalisation of Australia.

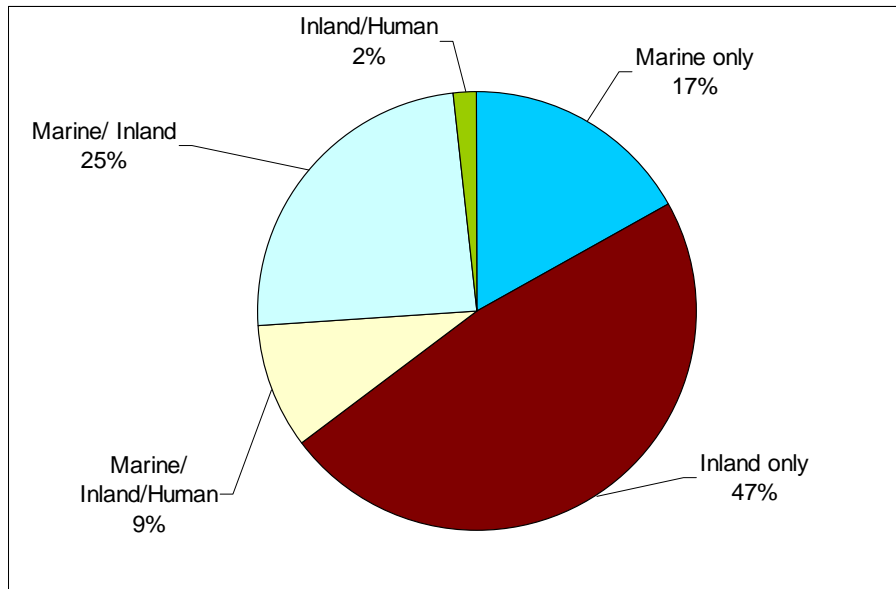
⁵ Interim Marine and Coastal Regionalisation for Australia.

Table 3-3 Area and number of Ramsar sites within IBRA and IMCRA bioregions

IBRA regional name	Code	Region size (ha)	Ramsar area (ha)	Number of Ramsar sites
Australian Alps	AA	1,171,758	663	2
Avon Wheatbelt	AW	9,414,776	493	1
Brigalow Belt North	BBN	11,283,483	35500	1
Ben Lomond	BEN	867,741	3594	3
Central Highlands	CH	1,103,223	517	1
Channel Country	CHC	30,554,315	2219100	2
D'Entrecasteaux	DE	398,010	4473	1
Dampierland	DL	8,945,678	209606	2
Darling Riverine Plains	DRP	10,551,073	25080	3
Esperance Plains	ESP	3,557,661	6317	2
Freycinet	FRE	647,828	5387	2
Furneaux	FUR	240,654	2257	1
Jarrah Forest	JF	4,601,333	10631	1
Murray-Darling Depression	MDD	19,748,019	38661	4
Mulga Lands	ML	25,784,995	289604	2
Naracoorte Coastal Plain	NCP	2,897,200	143700	2
New England Tableland	NET	2,934,700	258	1
NSW North Coast	NNC	6,017,058	44612	1
Pine-Creek Arnhem	PCA	5,157,576	1375940	2
Riverina	RIV	9,053,441	142582	5
South Brigalow	SB	3,632,924	3357	2
South East Coastal Plain	SCP	1,892,251	209656	5
South Eastern Queensland	SEQ	6,860,424	206474	2
Simpson-Strzelecki Dunefields	SSD	27,787,605	800	1
Swan Coastal Plain	SWA	1,521,449	29076	4
Top End Coast	TEC	6,931,917	220700	1
Tasmanian Midlands	TM	769,751	3334	1
Victoria Bonaparte	VB	7,244,082	258948	2
Victorian Volcanic Plain	VVP	2,213,027	32898	1
Woolnorth	WOO	966,686	7034	1
IMCRA				
Sundra Province (Christmas Island)	SunP(b)	22,001	57	2
Sundra Province (Cocos Keeling Islands)	SunP(a)	122	122	1
Oceanic shoals	OSS	112284	58300	1
Group 16	Group 16	844160	1729200	1
Norfolk Province (Lord Howe Island)	NorF P (B)	188,000	188000	1
Total		215,917,205	7,506,931	65

Wetland Types

Ramsar wetlands encompass a broad range of environmental settings, ranging from coral reefs to estuaries and inland marsh and riverine environments. Based on the *Ramsar Classification System for Wetland Type*,⁶ most Ramsar wetlands have inland wetland types (47% of wetlands), whereas 25% of wetlands have both marine/coastal (hereafter referred to as marine wetlands) and inland wetland types (Figure 3-2; sourced from Ramsar Information Sheets). Seventeen percent of sites have marine wetland types only, and 9% of sites have a combination of marine, inland and human-made wetland types. One site is classified as an inland/human-made wetland type.



Source: Ramsar Information Sheets.

Figure 3-2 Percentage of sites containing different combinations of wetland types

All of the marine wetland habitat types and inland wetland habitat types, in addition to five of the nine artificial wetland habitat types, used in the Ramsar Classification System for Wetlands are represented in Ramsar estate. The most commonly recorded wetland type was *Ts: Seasonal freshwater marshes and pools on inorganic soils* (present at 23 sites), followed by three marine/coastal wetland types (*G: intertidal mud flats*, *E: sand/shingle beaches* and *F: estuarine waters*), and *N: seasonal/intermittent rivers*, which were each recorded at 20 sites.

A Global Review of Wetland Resources and Priorities for Wetland Inventory (Finlayson and Spiers 1999) identifies wetland types for which inventory data were lacking and which are poorly represented in the Ramsar List of Wetlands of International Importance. Ramsar Convention Resolution VII.20 calls upon Contracting Parties to give attention to these priority wetland habitats which include: seagrasses, coral reefs, salt marshes and coastal flats, mangroves, arid zone wetlands, peatlands, rivers and streams, and artificial wetlands.

Several wetland types are either not represented or poorly represented in Australian Ramsar estate. These include habitat types such as: karst and cave systems; forested peatlands; tundra wetlands; freshwater springs; coastal freshwater lagoons; coral reefs; and arid zone wetlands. Overall, artificial

⁶ Recommendation 4.7 and amended by Resolutions VI.5 and VII.11 of the Conference of Contracting Parties.

wetland habitat types are the least well represented wetlands in Australia's Ramsar estate. Seven of the listed sites within Australia have artificial wetland habitat components. These sites include site 24 (Hunter Estuary Wetlands), site 25 (The Coorong and Lakes Alexandrina and Albert), site 18 (Port Phillip Bay), site 42 (Bowling Green Bay), site 2 (Kakadu National Park (stage 1)), site 41 (Moreton Bay) and site 32 (Lakes Argyle and Kununurra).

It is notable that most of these wetland types are also not well represented in the Directory of Important Wetlands in Australia (Environment Australia, 2001). This tends to suggest that some of these wetland classes are either non-existent, poorly represented, or poorly known within Australia and its external territories.

For other more commonly occurring wetland habitat types that are poorly represented such as coral reefs, it is likely that there are alternative management regimes, such as marine protected areas that are achieving equivalent conservation outcomes Ramsar Convention of Wetlands.

3.1.2 Ramsar Wetland Extent

Overall, the 64 listed Ramsar wetlands cover a total area of 7,368,627 ha (Table 3-2). Three wetlands together represent approximately 59% of Australia's Ramsar estate:

- Coongie Lakes (site 27), located in South Australia (1,980,000 ha, or ~27% of the total Australian Ramsar estate) (Figure 3-4);
- the Commonwealth administered Coral Sea Reserves (site 59), which covers an area of 1,729,200 ha (or 23% of Australia's Ramsar estate); and
- the Commonwealth administered Kakadu National Park (Stage I, and wetland components of Stage III), which covers an area of 683,000 ha (or 9% of Australia's Ramsar estate).

The smallest Ramsar site, Hosnie's Springs (site 40), is 0.13 ha (Figure 3-4; Table 3-1).

There was a positive relationship between number of wetland types and log wetland area for "marine and inland" wetlands ($r^2 = 0.52$), and "inland" wetlands ($r^2 = 0.35$). However there was no clear relationship between wetland area and diversity within "marine" wetlands, and wetlands containing "marine, inland and human-made" components (Figure 3-5). This indicates that the larger the wetland area, the greater the number of wetland habitat types that may exist in that area.

Overall, the nine sites managed by the Commonwealth (jointly with the states or as sole manager) covered the largest area of Australian Ramsar estate (3,351,619 ha, or 45% of Australia's Ramsar estate) (Figure 3-6). Twenty-seven percent (27%) of Commonwealth administered wetlands comprise Ramsar sites located in external territories, with 19% located in the Northern Territory and remaining 3% within Queensland. South Australia had the second largest area of Ramsar estate (30%), followed by Queensland (5%, excluding 3% jointly managed with Commonwealth), Western Australia (7%), Victoria (4%), NSW (~2%), Northern Territory (3%, excluding 19% jointly managed with Commonwealth), and Tasmania and ACT (each <0.5%). Therefore, despite having a relatively large number of Ramsar wetlands, Victoria, NSW and Tasmania did not have a proportionally large total area of Ramsar wetlands (Table 3-2). This is a consequence of the comparatively small size of most of the wetlands in these states.

Approximately 71% of the total area of Ramsar estate is represented in three IBRA/IMCRA bioregions: CHC (2219100, or 30%), Group 16 (1729200, or 23%), and PCA (1375940, or 18%). All other bioregions individually represented <4% of the total Ramsar estate. There is no relationship between number and area of Ramsar wetlands within bioregions, with the three largest (by area) bioregions represented by only 1 or 2 wetland sites (Table 3-3).



Figure 3-3 Number of Ramsar sites containing various wetland types

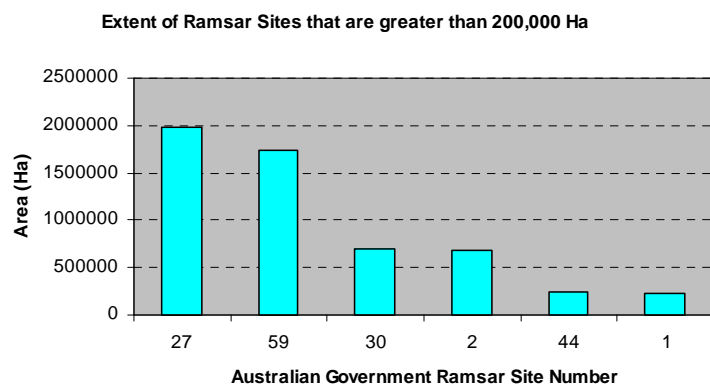
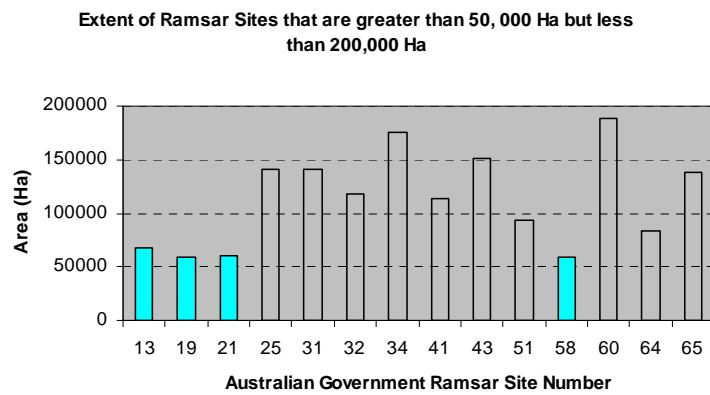
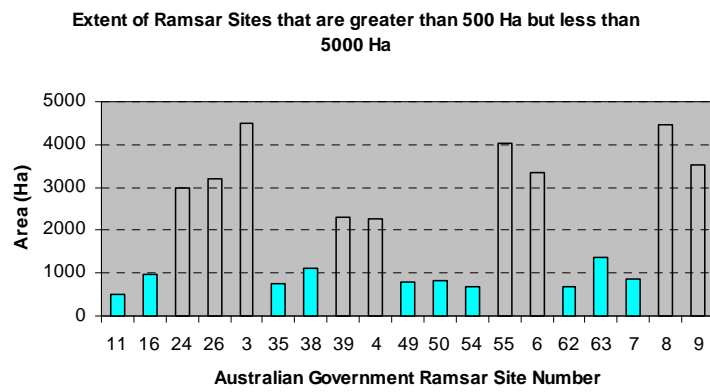
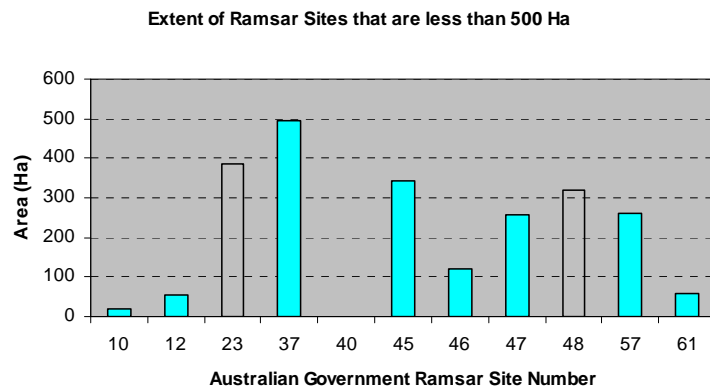


Figure 3-4 Area of each Ramsar site listed in Australia

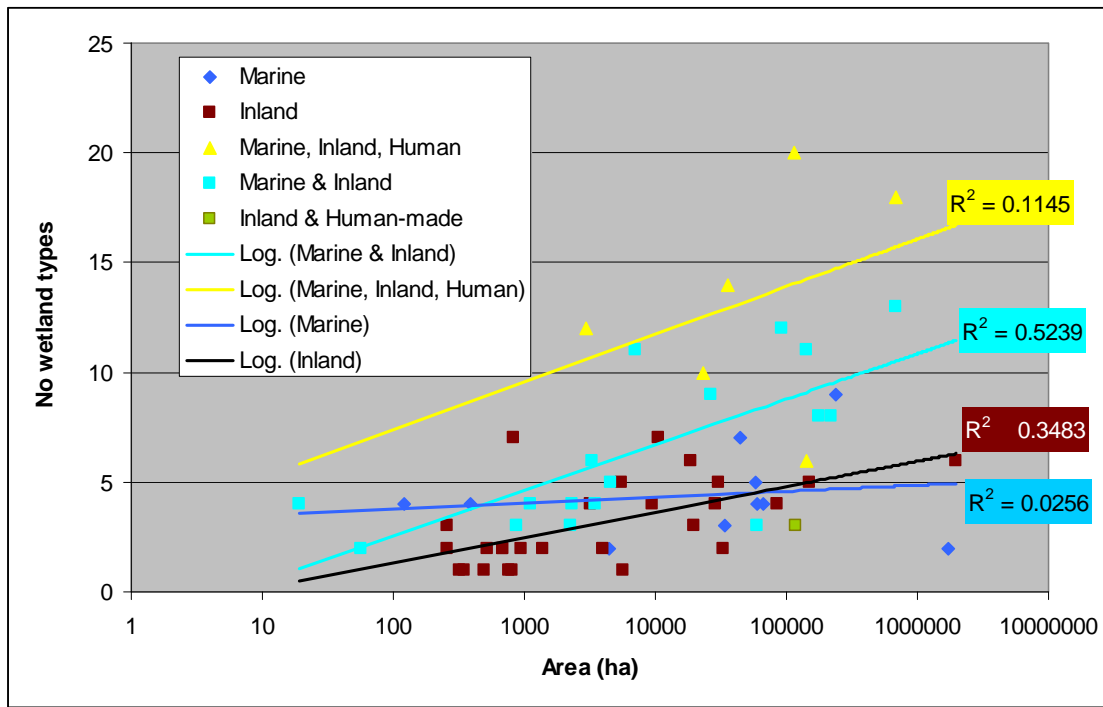


Figure 3-5 Log wetland area (ha) and number of wetland types within each wetland

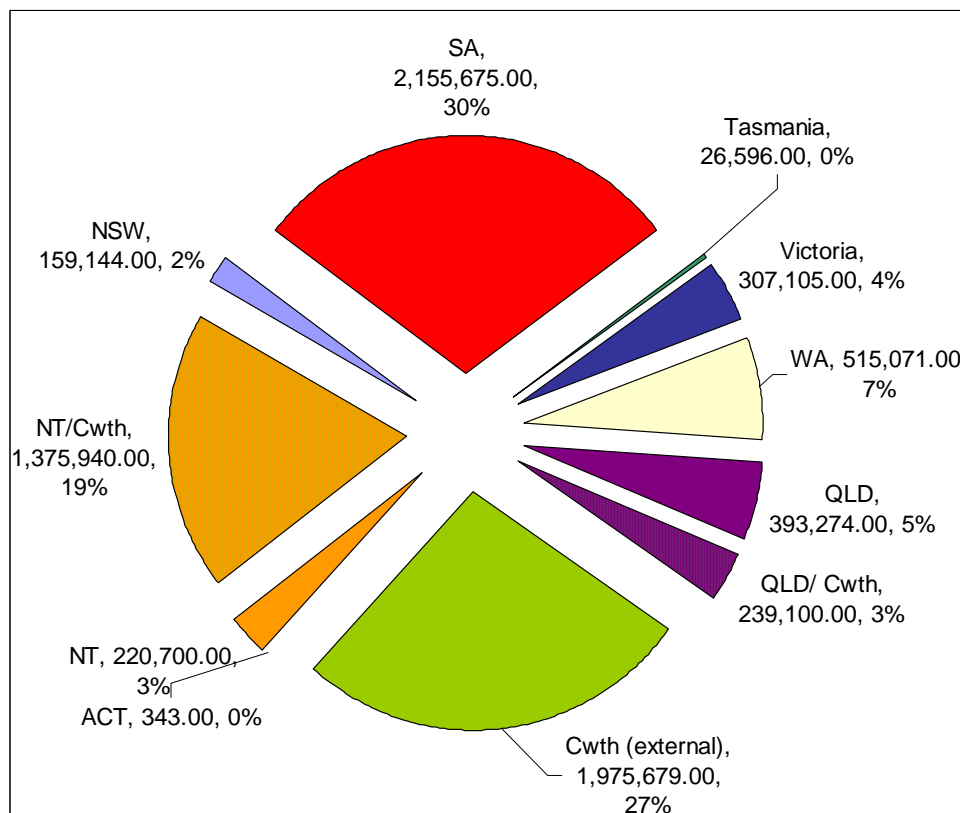


Figure 3-6 Ramsar wetland area by locality and management responsibility (excludes site 65)

3.1.3 Wetland Tenure

Land tenure is a multi-layered system of responsibilities, rights and administrative arrangements that together shape the access of land and activities/uses that can be undertaken of the land. Australian, State or Territory Government agencies are responsible for wetlands on public lands, whereas wetlands on private land may be managed by traditional owners, private corporations, community trusts or private landholders.

In preparing this section of the study report, a process was followed involving the review of tenure classifications as set out in the RIS documents for Ramsar sites. This was then cross-referenced against the site manager questionnaire responses about tenure for Ramsar sites. As part of comments received on the Draft of this study report, State Government representatives advised that some data from both sources were incorrect and should be updated. This was in part due to the likely misunderstanding of this question in the questionnaire by respondents but also reflects that many RIS documents used in the analysis are not “up-to-date” (refer to section 3.3). There is also an inherent difficulty in analysing this data at a national scale as a result of the fact that each State has its own unique tenure classification system set under relevant State laws and policies. For example, it is likely that ‘private property’ in one State may fit into the category of ‘freehold’ supplied by another. Similarly, ‘leasehold land’ has not been considered by some respondents as a type of ‘Crown land’ tenure.

The information in this section of the report has been presented in an unmodified form from the initial RIS and questionnaire response analyses in order to reflect the variation in terminology used with respect to tenure issues in Ramsar sites. As will be outlined below, a key recommendation for the rolling review will be to develop a more simplified classification system for land tenure that can be applied across the Ramsar estate but remains acceptable to all jurisdictions and does not replace or otherwise alter the specific State Government tenure system that would continue to operate at the individual site level.

Review of RISs

Ramsar Information Sheet’s (RISs) lists land tenure applicable to each site. A review of RISs identified 15 types of land tenure over Australia’s Ramsar estate (Table 3-4). There are several important points that need to be considered when interpreting these data:

- Firstly, the tenure categories outlined in the RISs vary among states and do not necessarily conform to the standardised, national scale tenure categories adopted in *Australian Land Tenure 1993* (Geoscience Australia 2004).
- There are inconsistencies in the types of tenure reported for wetlands. An example of this is the non-listing of crown land tenure in wetlands containing conservation reserves (e.g. national parks or nature reserves). Similarly, there are instances where crown lands have been noted to occur in a site, but conservation reserves have not been listed but are known to occur (e.g. Moreton Bay). In most cases conservation areas are public lands, although there are instances where, for example, Aboriginal freehold land is leased to a conservation authority as national park. For this reason, it is not possible to simply flag all conservation reserves as crown land. A further example of this is the freehold/private land designations. There are two instances (site 41 in

Queensland and site 25 in South Australia) where both tenure types have been identified in a single site, although it is unclear from existing information why these have been separated.

- Multiple forms of land tenure can apply to a single parcel of land, and the relationships between these different forms of tenure may vary within and among sites.

Because of these uncertainties, it is not a simple matter to collate the various land tenures outlined in RISs into standardised classes, such as those outlined in Geoscience Australia (2004). Recognising these constraints, the results in Table 3-4 should therefore be considered as indicative only at this stage.

Despite the above-mentioned limitations, based on RIS data, it would appear that most Ramsar sites had a single form of tenure (typically crown/conservation reserve). As mentioned previously, there are instances where conservation reserves are known to occur within a Ramsar site, but the RIS simply identifies this as Crown land. For this reason, the information contained within RISs is not suitable for reporting and assessing conservation estate tenure within Ramsar wetlands at a national level.

Other land tenures that occur within Ramsar sites include freehold land (12 sites), which is land that has been purchased outright and a Deed of Grant has been issued, or leasehold land (12 sites), in which the land has been rented or allocated *via* a similar arrangement for a fixed period of time from the Crown (i.e. pastoral lease). Site 1 (Cobourg Peninsula) differs from other sites in that it contains Freehold Aboriginal land and Aboriginal Trust land tenures. 'Game reserves' occur at two sites in South Australia (sites 26 and 63), and one site in Tasmania (site 3).

Table 3-4 Land tenure outlined in Ramsar Information Sheets

Site	Wetland Name	Location	Public		Conservation			Other Reserve			Lease	Native Title/Aboriginal			Freehold	Private
			Crown	Unallocated	Cons. Area	National Pk.	Nature Res.	Marine Pk.	Special	Reserve		Gaming	Native Title	Freehold (Aborig)		
45	Ginini Flats	ACT				*										
40	Hosnie's Spring	EXT (Cwth)				*										
46	Pulu Keeling	EXT (Cwth)	(*)		(*)							* (*)				
58	Ashmore Reef	EXT (Cwth)	*													
59	Coral Sea	EXT (Cwth)					*									
60	Elizabeth Middleton	EXT (Cwth)	*													
61	The Dales	EXT (Cwth)	*													
23	Towra Point	NSW					*									
24	Hunter Estuary	NSW					* (-)									* (-)
28	Macquarie Marshes	NSW					* (-)									* (-)
47	Little Llangothlin	NSW					*									
48	Blue Lake	NSW				*										
49	Lake Pinaroo	NSW				*										
50	Gwydir Wetlands	NSW										* (-)				* (-)
52	Myall Lakes	NSW				*	*									
53	Narran Lake	NSW					*									
62	Fivebough Tuckerbil	NSW	* (-)									* (-)				
64	Central Murray SF	NSW	*													
1	Cobourg Peninsula	NT						* (-)						* (-)	* (-)	
2	Kakadu I/III	NT (Cwth)				*										
30	Kakadu II	NT (Cwth)				*										
41	Moreton Bay	QLD	*			(*)		(*)							* (*)	* (*)
42	Bowling Green Bay	QLD		* (-)		* (-)			* (-)			* (-)				
43	Currawinya Lakes	QLD	*													
51	Great Sandy Strait	QLD	(*)	* (*)		* (*)						* (-)				
44	Shoalwater & Corio	QLD/ Cwth	* (*)			* (*)										
25	Coorong, Alexandrina Albert	SA	* (*)									(*)			* (*)	* (*)
26	Bool/Hacks	SA	* (-)		* (-)					* (-)						
27	Coongie	SA	(*)			*						* (*)				
29	'Riverland'	SA	* (*)									* (*)	(*)			*
63	Banrock	SA								*		*				*
3	Moulting	TAS	*							* (*)						
4	Logan	TAS			*											
5	Lavinia	TAS										* (*)				
6	Pittwater-Orielton	TAS	(*)	* (*)			* (-)					(*)				(*)
7	Apsley Marshes	TAS														* (-)
8	E. Coast Cape Barren Is	TAS										*				
9	Lower Ringarooma	TAS	* (*)									* (*)				*
10	Jocks Lagoon	TAS			*											*
11	Interlaken	TAS	*													
12	Little Waterhouse	TAS			* (*)											
13	Corner Inlet	VIC	* (*)					* (?)		* (?)					* (-)	
14	Barmah Forest	VIC	*													
15	Gunbower Forest	VIC	* (-)		(*)											
16	Hattah-Kulkyne	VIC	*													
17	Kerang Wetlands	VIC	* (-)	(-)	(*)											
18	Port Phillip	VIC	* (*)	(*)								* (-)				* (*)

Site	Wetland Name	Location	Public		Conservation			Other Reserve			Lease	Native Title	Native Title/Aboriginal		Freehold	Private
			Crown	Unallocated	Cons. Area	National Pk.	Nature Res.	Marine Pk.	Special	Reserve			Gaming	Freehold (Aborig)		
19	Western Port	VIC	*													
20	Western District L.	VIC														
21	Gippsland Lakes	VIC	* (-)													
22	Lake Albacutya	VIC														
57	Edithvale-Seafood	VIC														
31	Ord River Floodplain	WA					*						#			
32	Argyle Kununurra	WA					*						#			
33	Roebuck Bay	WA											# (*)			
34	Eighty-mile Beach	WA					*						#			
35	Forrestdale Thomsons Lakes	WA					*									
36	Peel-Yalgorup	WA			*	*	*									
37	Toolibin	WA					*									
38	Vasse-Wonnerup	WA	(*)													(*)
39	Lake Warden	WA					*									
54	Becher Point	WA				*										
55	Lake Gore	WA					*									
56	Muir-Byenup	WA					*									

Notes:

* Tenure type identified in RIS.

(*) Tenure type identified in questionnaire responses.

(-) Denotes that tenure not identified in questionnaire responses as another form of tenure; # native title claim at time of RIS reporting.

Shading indicates wetland where crown land/conservation estate and another forms of tenure identified in RIS (includes game reserves, although unknown whether this represents public land).

Site Manager Questionnaire Responses

There are two questions in the questionnaire that consider tenure within Ramsar sites:

- Question 7 – Is there another form of tenure (besides crown land) on the site (if yes, nominate tenure type)?
- Question 9 – Does your site have a private land component (if yes, nominate type)?

Questionnaire responses for question 7, and RIS data regarding land tenure, are shown Table 3-5. Respondents indicated that 21 sites (36% of sites) had another form of tenure (besides crown land/conservation park) within the site. The RISs indicated that 26 sites had another form of tenure (see shaded sites in Table 3-4). Specific discrepancies between the questionnaire response data and the RISs were found between data sources at sites:

- 24 (Hunter), which the RIS listed as having both conservation park and private land tenure;
- 28 (Macquarie Marshes), which the RIS listed as having both conservation park and freehold land tenure;
- 50 (Gwydir), which the RIS listed as having leasehold and freehold land tenure;
- 62 (Fivebough Tuckerbil), which the RIS listed as having crown land and leaseholder tenures;
- 1 (Cobourg), which the RIS listed as having conservation reserve, Freehold Aboriginal and Aboriginal Trust tenures;
- 42 (Bowling Green Bay), which the RIS listed as having crown land, conservation reserve, special reserve, and leaseholder tenures.

Note also that even at sites where other forms of tenure were identified, the tenure types listed differed in many cases between questionnaire responses and RIS data (Table 3-4).

For question 9, 21 sites were identified as having a private land component (Figure 3-7). Questionnaire responses indicated that Victoria and Tasmania had the highest number of sites with a private land component (Figure 3-7). Information held in RISs indicated that 14 sites had a private, freehold or freehold aboriginal land component (Table 3-4).

It is possible that there may be ambiguities in the questionnaire that could have lead to some of the discrepancies between information sources. It is also apparent however that information on site tenure is not well documented (in RISs) and/or understood by site managers (noting that for several sites, site managers responded that that they were unsure whether there are forms of land tenure held on the sites).

Table 3-5 Ramsar sites where respondents listed the site as having another form of tenure (besides crown land/conservation park)

Site No.	State/Territory	Crown land tenures			Other tenures				
		Crown Land	Unreserved Crown Land	Reserve (State/Nature/Conservation/National and Marine Park)	Game Reserve	Freehold	Leasehold	Native Title	Private Property
3	Tasmania	*			*				
5	Tasmania	*		*			*		
6	Tasmania	*	*	*			*		*
9	Tasmania	*					*		
12	Tasmania	*		*					
13	Victoria	*		*		*			
15	Victoria			*					
17	Victoria		*	*					
18	Victoria	*	*						*
20	Victoria			*			*		
21	Victoria			*				*	
25	SA	*				*	*		*
27	SA	*					*		
29	SA	*					*	*	
33	WA		*					*	
38	WA	*	*			*			
41	QLD			*		*			*
44	QLD/ Cwth	*		*					
46	EXT (Cwth)	*		*			*		
51	QLD	*	*	*					
62	NSW	*					*		

* Data in the above table is interpreted from questionnaire respondents. State representatives have advised that some of the data is incorrect and needs to be updated. The unmodified data has been retained to illustrate the varied terminology used by respondents in filling out the questionnaire with respect to tenure issues.

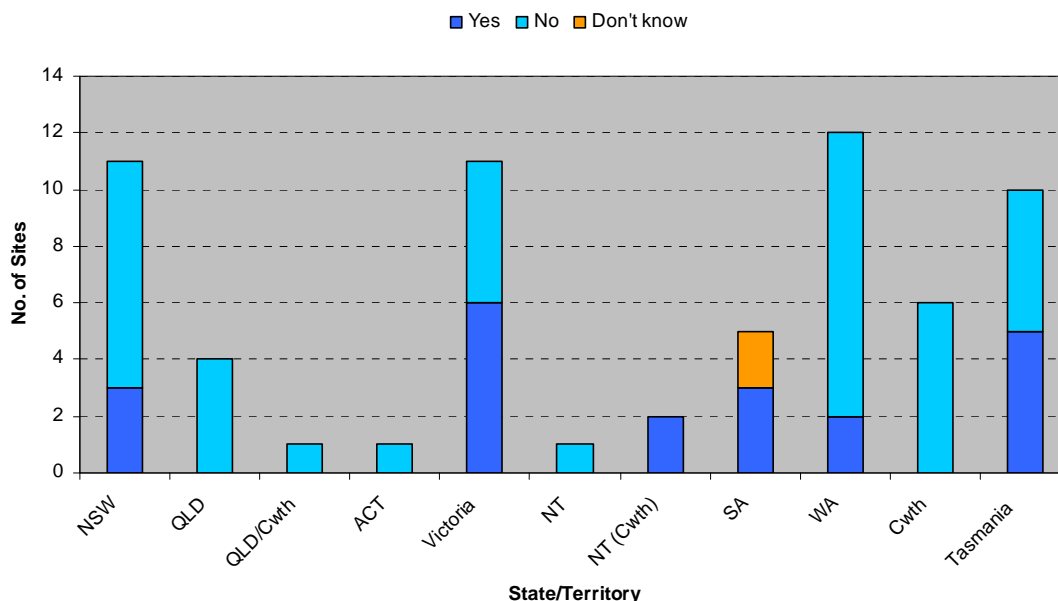


Figure 3-7 Number of Ramsar sites with a private land component

To gain an appreciation of land tenure applicable to each site, there is a need to:

- Adopt standardised, national-scale tenure categories as outlined in *Australian Land Tenure 1993* (Geoscience Australia 2004).⁷ *Australian Land Tenure 1993* contains boundaries and attribute information on public and private land tenure, including Aboriginal and Torres Strait Islander lands vested in communities or equivalent bodies. It has been derived from Geoscience Australia's *National Public and Aboriginal Lands (NPAL)* data that has been sourced from government gazette notices, cadastral maps and plans. Note that these data are of a relatively coarse spatial scale (1:250,000). However refinement of these data, and/or the application of the standardised tenure categories to existing Ramsar site tenure mapping, is recommended.
- Incorporate these tenure data into relevant management documents for each site.

3.2 Wetland Threats and Impacts

3.2.1 Context

Since European settlement there have been major losses and degradation of Australia's wetlands. No systematic survey of wetlands or wetland values across Australia has been conducted to date (Finlayson and Rea 1999), although a number of coordinated wetland mapping and classification projects have been undertaken or are underway (e.g. Queensland EPA wetland mapping project).

Usback and James (1993) provide wetland loss estimates for Victoria (27%), and the southeastern part of South Australia (89%). It is estimated that more than 50% of NSW's coastal wetlands have been destroyed or highly modified since European settlement (Sainty & Associates 1996). In terms of inland NSW wetlands, the Macquarie Marshes (Macquarie River) have declined in extent by at

⁷ Australian Land Tenure 1993; http://www.ga.gov.au/image_cache/GA4107.pdf.

least 40%-50% (Kingsford and Thomas 1995), whereas there has been a 75% decrease in the area of some Gwydir River wetlands over 20 years (Keyte 1992).

While many of the major losses in wetland extent occurred historically, there have also been many documented changes in wetland extent and status in the last few decades. For example, the WA Environmental Protection Authority (2007) states that between 1996 and 2004, 4% of vegetation in remaining wetlands on the Swan Coastal Plain was lost or became severely degraded, which was the equivalent of approximately 1500 ha of wetland area lost each year.

3.2.2 Threats

Ongoing threats leading to wetland degradation in Ramsar sites may ultimately lead to wetland loss. Moser *et al.* (1999) found that the main categories of processes producing ecological change in wetlands (i.e. threats) were:

- loss of wetland area;
- changes in the water regime;
- changes in water quality;
- unsustainable over-exploitation of wetland products; and
- introduction of new species.

The following provides a discussion on the key threats identified in each of the broad wetland type described in Table 3-3, and is based on information supplied by Ramsar site managers.⁸ The threat activities discussed below have been taken directly from the International Union for the Conservation of Nature (IUCN) and the Conservation Measures Partnership (CMP) standardised hierarchical classification of commonly encountered environmental threats and conservation/management actions.⁹ This list of threats was also referenced within the draft Framework for developing Ecological Character Descriptions available at the time of the study. However, it is acknowledged that there is overlap between many of these threat activities and that some threats may also be classified as an 'impact' in some contexts.

Marine/Coastal Wetland Types

In 'marine' wetlands ($n = 10$, see Table 3-1 for Ramsar wetland types), respondents identified fishing and harvesting as one of the top five threats to the wetland at four of the 10 sites (sites 46, 58-60). The top ranked threat for others sites were aquaculture (Site 33 (Roebuck Bay), pearl farming), which is not ranked as a key threat elsewhere; climate change (site 46 (Pulu Keeling NP)); general human disturbance (sites 46 and 44 (Pulu Keeling NP and Shoalwater and Corio Bays)); and invasive/alien species, solid waste, other modifications, transport/shipping and species mortality (all ranked 1 at site 46 (Pulu Keeling NP)). Only one site ranked residential/commercial development as a key threat (site 44 (Shoalwater and Corio Bays)).

Fishing and harvesting was also the most frequently identified as the top threat to wetland values (4 sites). Climate change/severe weather, temperature extremes, and invasive/pest species were all

⁸ Site 65, Paroo River has been removed from the analysis, as there was no questionnaire completed for this wetland. The sample size shown within this section reflects the number of respondents that answered the relevant question in the questionnaire. Sample size does not reflect the number of sites listed as marine, inland or human-made (refer Table 3-1).

⁹ Proposed classification of Direct Threats; <http://conservationmeasures.org/CMP/IUCN/browse.cfm?TaxID=DirectThreats>.

identified in the top 5 threats at four sites, whereas general ecosystem degradation and pollution were identified as key threats at 3 sites (Figure 3-8).

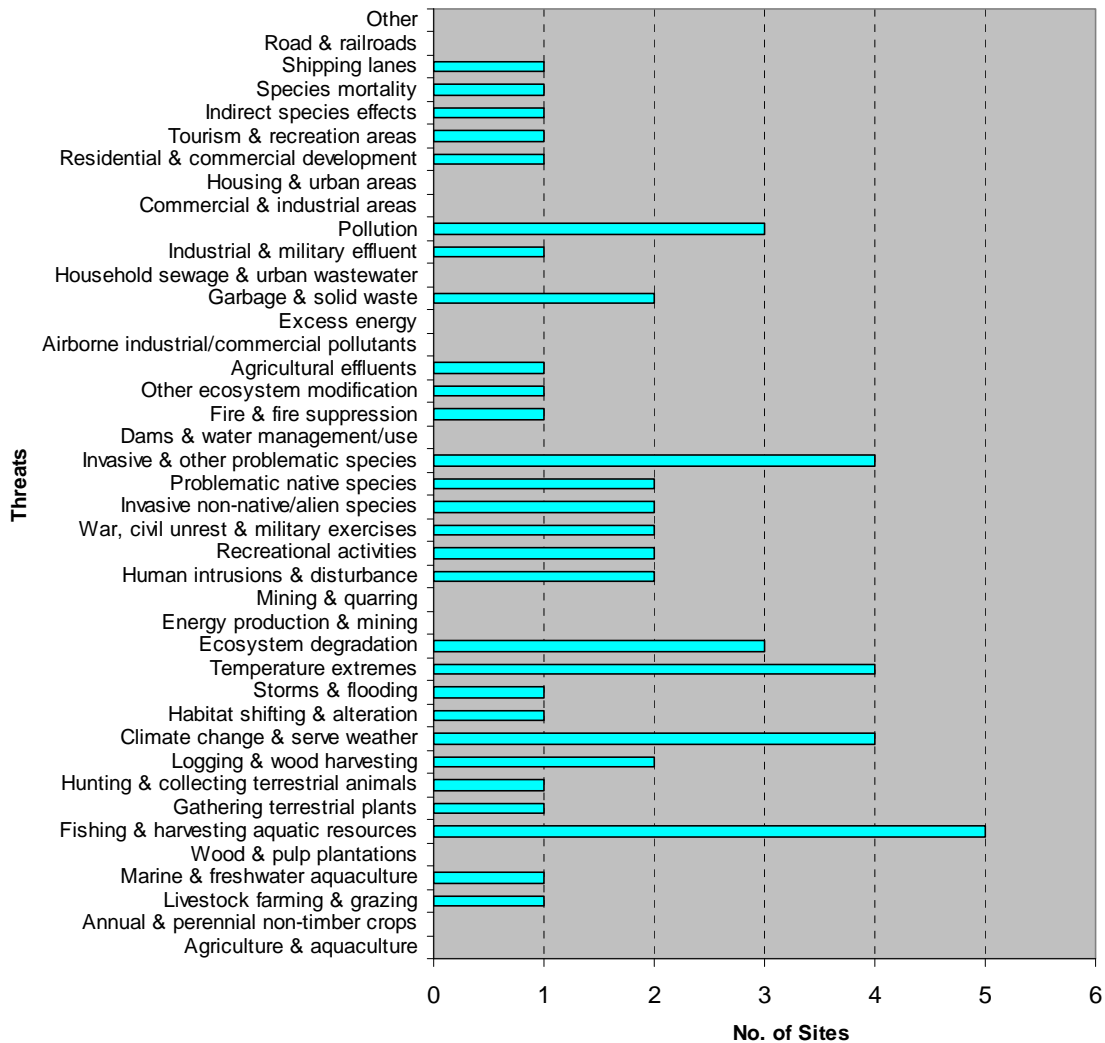


Figure 3-8 Key identified threats at marine Ramsar wetland sites where respondents were asked to rank the top five threatening activities (n =10)

Inland Wetland Types

For 'inland' wetland sites ($n = 31$), respondents identified invasive/pest species (17 sites) and dams and water management (16 sites) as one of the top 5 threats to wetlands. These were followed by climate change (12 sites), general ecosystem degradation and aquaculture/agriculture (10 sites) and habitat shifts/alterations (8 sites).

In terms of top ranked threats (Figure 3-9):

- Dams and water management is the top ranked threat at 12 sites: sites 11 (Interlaken), 14 (Barmah Forest), 16 (Hattah-Kulkyn), 17 (Kerang), 28 (Macquarie Marshes), 29 (Riverland), 39 (Lake Warden), 50 (Gwydir), 53 (Narran Lake), 57 (Edithvale-Seaford), 63 (Banrock Station) and 64 (NSW Central Murray State Forests);
- Climate change was identified as the top threat at sites 45 (Ginini Flats), 47 (Little Llangothlin), 48 (Blue Lake) and 49 (Lake Pinaroo);
- Agriculture/aquaculture were identified as the top threat at sites 37 (Lake Toolibin), 55 (Lake Gore) and 56 (Muir-Byenup System);
- General ecosystem degradation was identified as the top threat at sites 15 (Gunbower Forest), 20 (Western District Lakes) and 43 (site 43 Currawinya Lakes);
- Residential and/or commercial development was the top ranked threat at site 38 (Vasse-Wonnerup) and site 35 (Forrestdale and Thomsons Lakes);
- Recreation activities was identified as the top threat at Site 54 (Becher Point);
- Plantation was identified as the top threat at Site 26 (Bool and Hacks Lagoon), and
- Farming/grazing was identified as the top threat at site 22 (Lake Albacutya).

Not surprisingly, the top ranked threats differed greatly between marine and inland wetlands types. The key threats consistently identified in both types of wetland were climate change and general ecosystem degradation.

Marine/Inland Wetland Types, including Human-Made Wetland Types

The following discussion relates to wetlands identified as having 'marine' and 'inland' wetland types, either without ($n = 16$ sites) or with 'human-made' ($n = 6$ sites) wetland types, as defined according to the Ramsar wetland type classifications outlined in Table 3-1. For these wetland types, respondents identified dams and water management (13 sites) and agricultural effluents (10 sites) and as one of the top 5 threats to wetlands. Six sites identified climate change, invasive species and aquaculture/agriculture and habitat shifts/alterations as key threats, whereas four sites identified fishing, habitat shifts/alterations, ecosystem degradation and residential/commercial developments as key threats. It is therefore apparent that the key threats this wetland encompassed were predominantly catchment-based, the obvious exceptions being fishing and possibly other non-specific threats (e.g. ecosystem degradation, habitat shifts, etc).

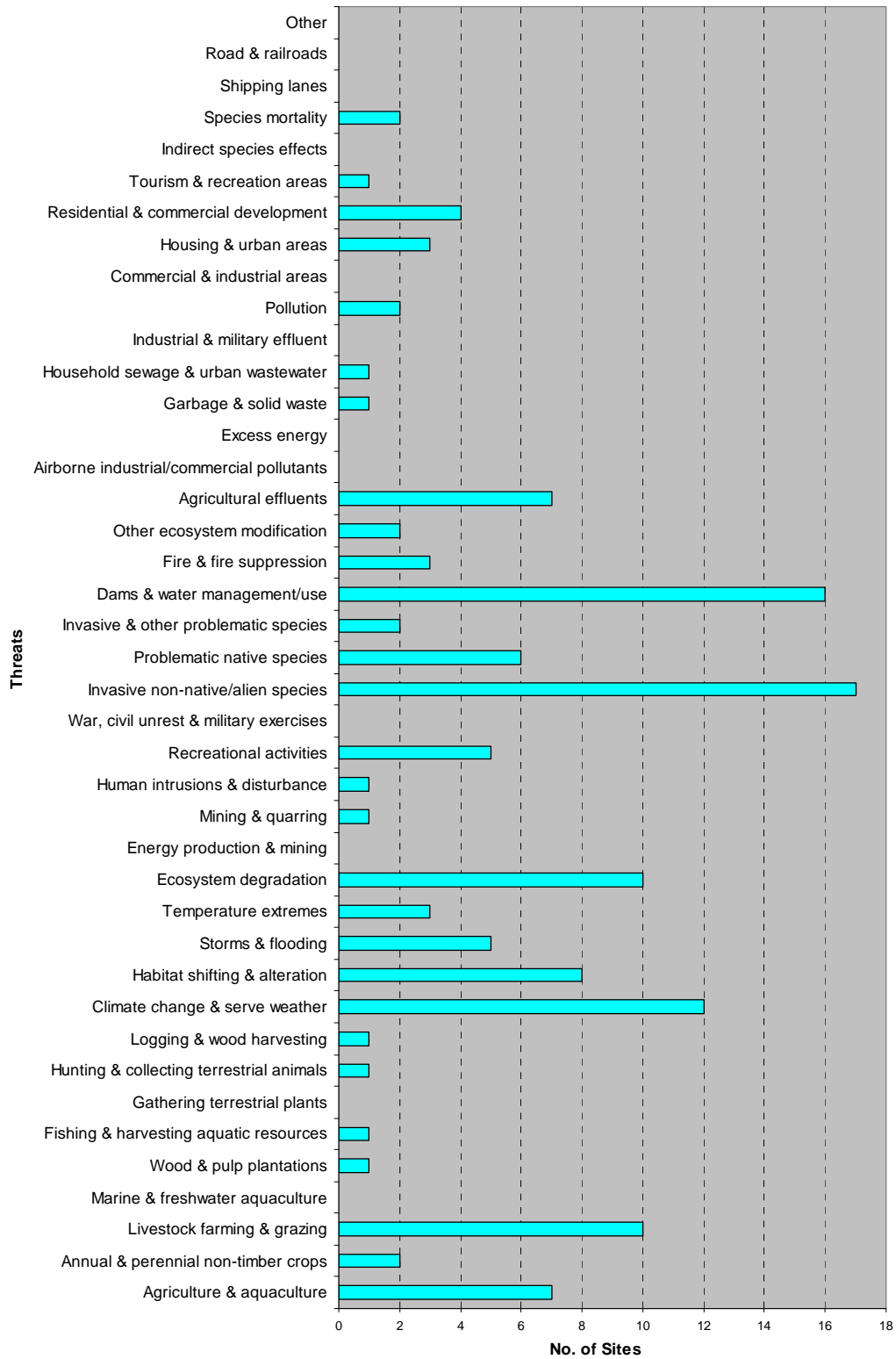


Figure 3-9 Key identified threats at inland Ramsar wetland sites where respondents were asked to rank the top five threatening activities (n = 31)

The following key threats were ranked in the top five threats for the sites listed (Figure 3-10):

- Agriculture/aquaculture: sites 1 (Cobourg Peninsula), 3 (Moutling Lagoon), 21 (Gippsland Lakes), 31 (Ord River Floodplain), 34 (Eighty-Mile Beach) and 36 (Peel-Yalgorup);
- Non-timber crops, agriculture/grazing and agricultural pollution, urban development were ranked the top threat at site 41 (Moreton Bay);
- Invasive species: sites 12 (Little Waterhouse Lake), 18 (Port Phillip Bay) and 42 (Bowling Green Bay);
- Dams and water management/use: sites 25 (Coorong and Lakes Alexandrina and Albert) and 51 (Great Sandy Strait);
- Agricultural modifications: site 4 (Logan Lagoon) and 41 (Moreton Bay);
- Habitat alteration: site 5 (Lavinia);
- Ecological degradation: site 6 (Pitt Water – Orielton Lagoon);
- Mining/quarrying: site 9 (Lower Ringarooma River); and
- Urban sewage: site 24 (Hunter Estuary Wetlands).¹⁰

Summary

It is apparent that the known or likely threats to wetlands differ between wholly marine and inland wetlands. Wetlands containing both inland and marine components reportedly had a similar suite of threats as inland wetlands, together with a small number of other threats more typically recorded in marine wetlands (most notably being fishing).

In all wetland types, it is apparent that many of the identified key threats are likely to operate both within and external to the wetland. This obviously presents difficulties from a management perspective. While a protected area or site based management plan may be able to address threats occurring within the wetland, such designations or plans may not have the jurisdiction or scope to address threats whose origins are outside the wetland.

It is important to note also that the data on which this assessment has been made is based on information supplied by site managers. While site managers ranked the top known/threats within each site, these results are not weighted or scaled according to the magnitude of impact at the site. There is also no means of validating the accuracy of these data, during the course of this study, as there is no systematic description of threats (or impacts) and their magnitude within listed Ramsar wetlands.¹¹ This is a gap that needs to be addressed and has been recommended to be addressed as part of the rolling review (see section 4.1.2).

¹⁰ Note that this reference relates only to the Shortland Wetlands Component of the site.

¹¹ Some descriptive information is contained in RISs and Management plans, however this is not generally of a sufficient level of detail to define and compare threats and their magnitude at a national scale.

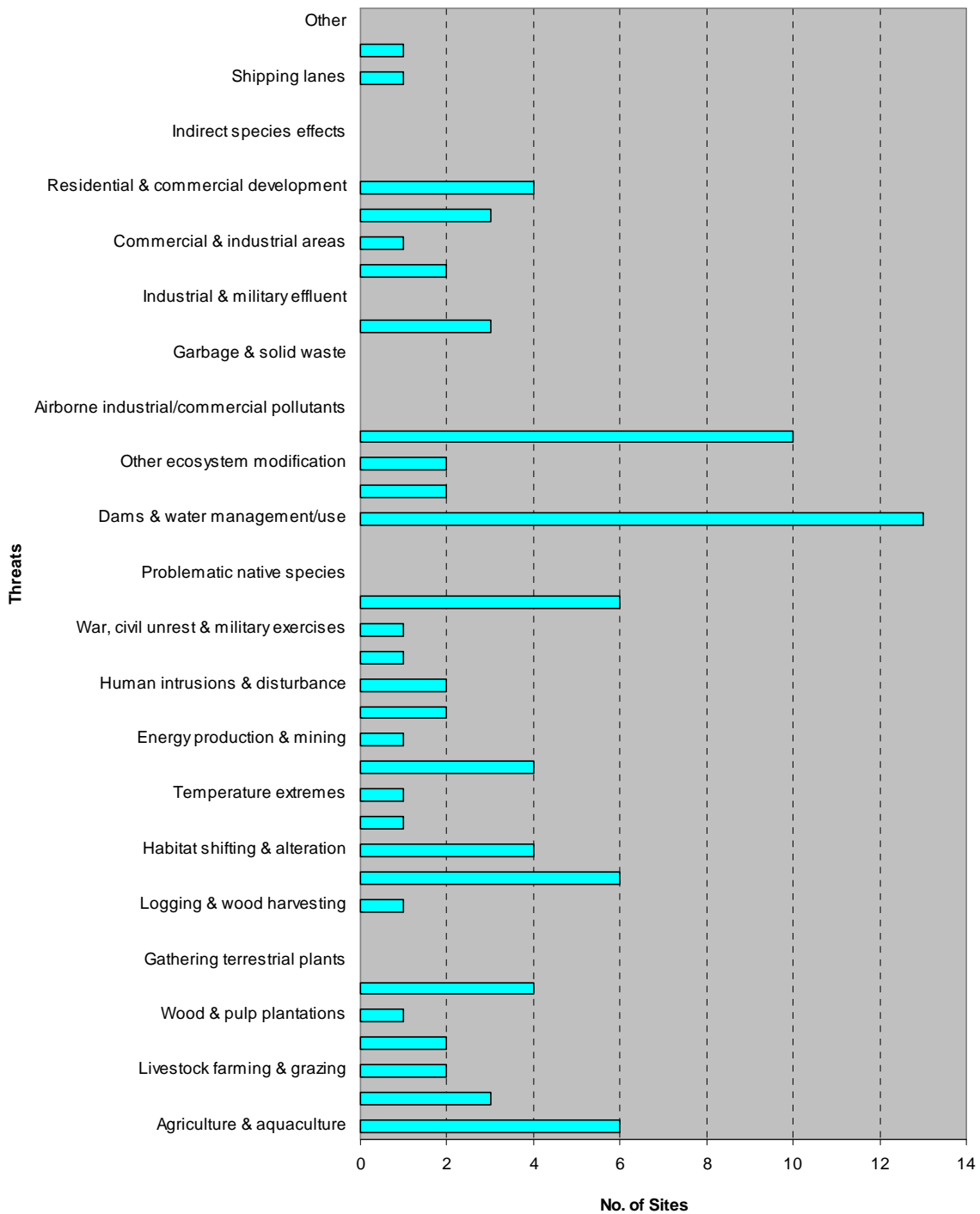


Figure 3-10 Key identified threats at marine and inland (including human-made) Ramsar wetland sites where respondents were asked to rank the top five threatening activities (n = 16)

3.2.3 Impacts

Consistent with patterns in key threats, there were differences in the types of key known or likely impacts between marine, inland, and marine and inland (either with or without human-made components) wetland types¹² (Figure 3-11). Consequently, these are discussed separately in the following report sections. The impact categories used in the questionnaire were developed by BMT WBM for the purpose of the Ramsar Snapshot study in consultation with DEW.

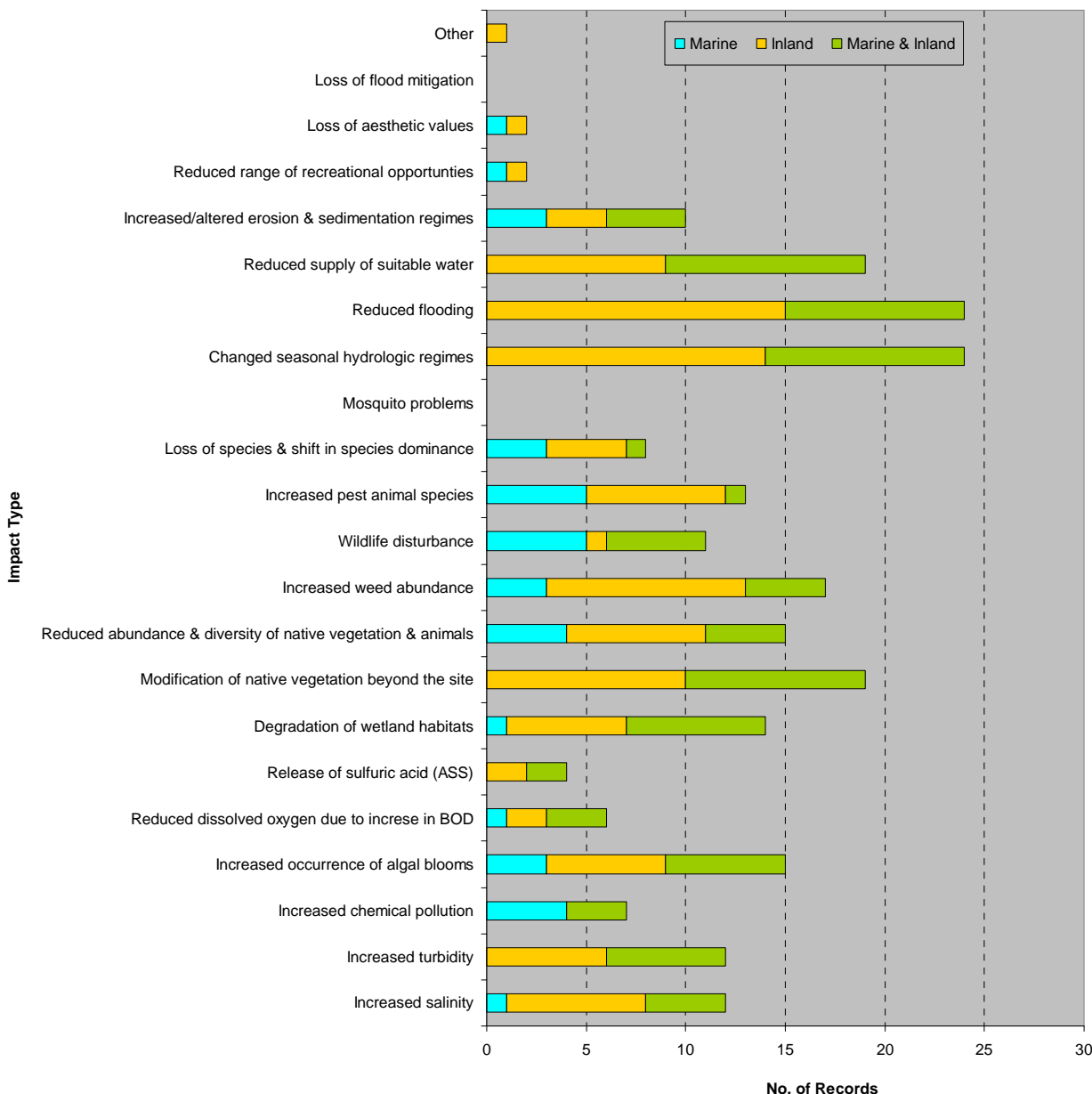


Figure 3-11 Key identified impacts within marine, inland, and marine and inland (+/- human) Ramsar wetland sites

¹² As defined by site managers.

Marine Wetlands

The key known or likely impacts to solely marine Ramsar-listed wetlands were (Figure 3-11):

- Increased pest animals and general wildlife disturbance, which were both identified as one of the top five key impacts at 5 of the 10 sites.
- Reduced abundance and diversity of native vegetation and animals, and increased chemical pollution, were both identified as one of the top five key impacts at 4 of the 10 sites.
- Algae blooms, increased weeds, and the loss of species with an associated shift in species dominance, were all identified as one of the top five key impacts at 3 of the 10 sites.
- Increased salinity, low dissolved oxygen (due to Biochemical Oxygen Demand increases), degradation of wetland habitats, reduced recreational opportunities and reduced aesthetic values were all identified as one of the top five key impacts at a single site.

Increased pest animals (site 59 (Coral Sea Reserves) and site 60 (The Dales – Christmas Island)) and general wildlife disturbance (site 46 (Pulu Keeling National Park) and site 58 (Ashmore Reef)) were both identified as the top impacts at 2 of the 10 sites. These four sites are relatively remote from major urban centres, and it is perhaps notable that the types of impacts identified, particularly at sites 59 and 60, generally differed from sites located near more urbanised areas.

The top ranked impacts at the remaining six sites varied among sites as follows:

- Increased salinity was identified as the top impact at site 13 (Corner Inlet). This is reportedly a consequence of both dryland salinity and increasing tidal water intrusion into coastal plain habitats (Molloy *et al.* 2005).
- Increased chemical pollution was identified as the top impact at site 19 (Port Phillip Bay). This site is the receiving waters of a highly urbanised catchment and is known to have high concentrations of a range of contaminants.
- Occurrence of algae blooms was identified as the top impact at site 33 (Roebuck Bay). Several blooms of the toxic blue-green algae *Lyngbya* (*Lyngbya majuscula*) have been reported at Roebuck Bay.
- Reduced abundance and diversity of native vegetation and animals was identified as the top impact at site 60 (Elizabeth and Middleton Reefs). The exact cause of any reduction in biodiversity values is not known, as these reefs are relatively remote from inhabited areas, and levels of human impacts are thought to be relatively minor (Done and Wilkinson 1998).

Inland and Inland/Marine Wetlands

Overall, the most frequently identified impacts to inland and inland/marine Ramsar wetlands were associated with changes in flow regimes, namely:

- reduced flooding, which was the top ranked impact in both inland and inland/marine wetlands;
- altered hydrological regimes, which was the second ranked impact in both inland and inland/marine wetlands; and

- reduced supplies of suitable water, which was the third most frequently identified key impact overall.

Other impacts associated with altered flow regimes, such as increased salinity, were also identified as key threats at several sites, typically in association with other hydrological regime pressures.

Modification of native vegetation beyond the site was ranked as the equal fourth highest impact to Ramsar wetlands overall (with reduced water supply). Weeds, feral animals and water quality (turbidity, salinity) degradation were also frequently identified in the top five key impacts to inland and inland/marine wetlands.

The top ranked impacts at these sites were:

- Reduced flooding was identified as the top ranked impact at 6 sites: sites 3 (Moulting Lagoon), 14 (Barmah Forest), 16 (Hattah-Kulkne Lakes), 22 (Lake Albacutya), 29 (Riverland) and 50 (Gwydir Wetlands);
- Changed seasonal hydrological regimes was identified as the top ranked impact at 5 sites: sites 31 (Ord River), 64 (Central Murray), 63 (Banrock Station), 45 (Ginini Flats) and 17 (Kerang);
- Modification of native vegetation beyond the site was identified as the top ranked impact at 5 sites: sites 5 (Lavinia), 6 (Pitt-Water), 47 (Little Llangothlin), 43 (Currawinya Lakes) and 39 (Lake Warden);
- Increased salinity was identified as the key impact at 5 sites: sites 36 (Peel Yalgorup), 37 (Lake Toolibin), 21 (Gippsland Lakes), 25 (Coorong and Lakes Alexandrina and Albert) and 56 (Muir-Byenup System);
- Degradation of wetland habitats was identified as the top ranked impact at 4 sites: sites 12 (Little Waterhouse), 9 (Lower Ringarooma), 35 (Forrestdale and Thomsons Lakes) and 20 (Western District Lakes);
- Reduced supply of suitable water was identified as the top ranked impact at 4 sites: sites 4 (Logan Lagoon), 53 (Narran Lake), 28 (Macquarie Marshes) and 15 (Gunbower Forest);
- Turbidity was identified as the key impact at 3 sites: sites 51 (Great Sandy Strait), 41 (Moreton Bay) and 11 (Interlaken);
- Increased occurrence of algal blooms was identified as the key impact at 3 sites: sites 24 (Hunter Estuary wetlands), 55 (Lake Gore) and 38 (Vasse-Wonnerup);
- Increased chemical pollution was identified as the key impact at 2 sites: sites 34 (Eighty Mile Beach) and 41 (Moreton Bay);
- Increased weed abundance was identified as the key impact at 2 sites: sites 42 (Bowling Green Bay) and 54 (Becher Point); and
- Pest animals was identified as the key impact at 1 site: site 18 (Port Phillip Bay and Bellarine Peninsula).

It is notable that these key impacts are typically associated with activities outside the wetland area. Impacting processes operating within the wetland (e.g. pest animals, weeds, degradation of wetland habitats) are also generally found in the surrounding catchment.

Table 3-6 lists the percentage of Ramsar sites where the impact under consideration was identified by site managers as one of the top five impacts at the site. Most sites within the Murray-Darling, Tasmania and North East Coast divisions were considered to have impacted hydrological/flow regimes. The Murray-Darling system, in particular, is one of the most heavily regulated river systems in the world, which has led to major reductions in wetland extent and wetland degradation (Young 2001).

A high proportion of sites (>50% of sites) in the Western Plateau, South West Coastal, and North East Coastal divisions identified water quality degradation as a key impact. These impacts were also evident within the respective states in which these divisions are located (Table 3-7). The types of water quality degradation varied among divisions, with high turbidity identified at two of the NE Division sites (Moreton Bay and Great Sandy Straits sites, located in SE Queensland), as well as SW Coast and Western Plateau sites. Acid generation from acid sulfate soils (ASS) was identified as one of the top 5 impacts at 38% of SW Coastal sites. Low dissolved oxygen (due to BOD increases) and incidents of algal blooms were identified as important impacts >10% of sites in most divisions. Chemical pollution was identified as one of the top five impacts at all Western Plateau sites, between 20-30% of sites in NE Coastal, Timor Sea and Marine divisions, and at only 8% of sites in the heavily urbanised SE Coastal division.

High levels of salinity were identified as a key impact at 10% of Tasmanian, 17% of SE Coastal, 33% Murray Darling, and 50% of SW Coast sites. At sites where high salinity was identified as an impact, it was typically ranked by site managers as the top 1 or 2 impacts to wetland values (see discussion above).

The nature of direct impacts to structural habitats and resident flora and fauna communities varied greatly among and within drainage divisions. There were no obvious differences in the suite of impacts among divisions, with all impacts generally well represented in all divisions (except Lake Eyre and Timor Sea sites).

When considering the results above it should be noted that there is no systematic way of comparing the magnitude of impacts among sites. While site managers ranked the top known/likely impacts (and threats) within each site, these results are not weighted or scaled according to the magnitude of impact at the site. For example, while a site manager may rank weeds as the top threat, the level of infestation may be low if the site is otherwise largely undisturbed by other impacting processes. Conversely, a site that is impacted by multiple impacting processes may not rank a particular impact in the top five impacts, although levels of impact for that process may be quite high. There is a clear need to develop a systematic method of describing, comparing and reporting impact magnitude among wetlands in future rolling reviews of Australia's Ramsar wetland estate.

Table 3-6 Key impacts to Ramsar wetlands within each Drainage Division

Impacts	Division								
	NE Coast	SE Coast	Tas.	Murray-Darling	SW Coast	Timor Sea	Lake Eyre	Western Plateau	Marine
Increased salinity	0	17	10	33	50	0	0	0	0
Increased turbidity	50	8	20	13	50	0	0	50	0
Increased chemical pollution	25	8	0	0	0	20	0	100	29
Increased occurrence of algal blooms	25	25	10	7	63	20	0	100	14
Reduced dissolved oxygen due to increase in BOD	25	0	0	0	38	20	0	50	0
Release of sulfuric acid (ASS)	0	8	0	0	38	0	0	0	0
Degradation of wetland habitats	25	25	40	27	25	0	0	0	0
Modification of native vegetation beyond the site	50	17	70	20	50	20	0	0	0
Reduced abundance & diversity of native vegetation & animals	25	25	20	13	25	0	0	50	57
Increased weed abundance	25	33	10	33	50	0	0	0	29
Wildlife disturbance	50	8	10	0	13	0	0	100	57
Increased pest animal species	0	25	0	33	25	0	0	0	43
Loss of species & shift in species dominance	0	8	0	20	25	0	0	0	29
Mosquito problems	0	0	0	0	0	0	0	0	0
Changed seasonal hydrologic regimes	50	8	60	73	38	20	0	0	0
Reduced flooding	50	17	70	80	13	0	0	0	0
Reduced supply of suitable water	75	17	50	60	0	0	0	0	0
Increased/altered erosion & sedimentation regimes	25	33	0	13	0	20	0	50	14
Reduced range of recreational opportunities	0	8	0	7	0	0	0	0	0
Loss of aesthetic values	0	0	0	0	13	0	0	0	14
Loss of flood mitigation	0	0	0	0	0	0	0	0	0
Other	0	0	0	7	0	0	0	0	0
<i>Number of wetlands</i>									
<i>Number of key impacts</i>	13	17	11	15	15	6	0	7	9

Note: Numbers represent **percentage of sites** within each division in which site managers identified the impact as one of the top five impacts.

Table 3-7 Key impacts to Ramsar wetlands within each state/territory

Impact type	ACT	EXT	NSW	Qld	SA	TAS	Vic	WA	Total
Increased salinity	0	0	0	0	2	1	4	4	11
Increased turbidity	0	0	1	2	1	2	1	5	12
Increased chemical pollution	0	2	0	1	0	0	1	3	7
Increased algal blooms	0	1	1	1	0	1	3	8	15
Reduced dissolved oxygen due to increase in BOD	0	0	0	1	0	0	0	4	5
Release of acid (ASS)	0	0	0	0	0	0	1	3	4
Degradation of wetland habitats	0	0	2	2	1	3	3	3	14
Modification of native vegetation beyond the site	0	0	2	3	0	6	2	6	19
Reduced abundance & diversity of native vegetation & animals	0	4	3	1	1	2	1	3	15
Increased weed abundance	0	2	4	2	0	1	5	4	18
Wildlife disturbance	0	4	0	2	0	1	1	3	11
Increased pest animal species	1	3	1	2	0	0	5	2	14
Loss of species & shift in species dominance	0	2	2	0	1	0	1	3	9
Mosquito problems	0	0	0	0	0	0	0	0	0
Changed seasonal hydrologic regimes	1	0	5	2	3	5	3	5	24
Reduced flooding	0	0	4	3	2	6	7	1	23
Reduced supply of suitable water	1	0	3	3	2	4	5	0	18
Increased/altered erosion & sedimentation regimes	0	0	1	2	0	0	4	3	10
Reduced range of recreational opportunities	0	0	0	0	0	0	2	0	2
Loss of aesthetic values	0	0	0	0	0	0	0	1	1
Loss of flood mitigation	0	0	0	0	0	0	0	0	0
Other	0	0	1	0	0	0	0	0	1

Note: Numbers represent the **number of sites** within each state/territory in which the impact was identified as one of the top five impacts by site managers.

3.3 Wetland Administrative Responses

3.3.1 Management Plans

Under the *EPBC Act*, the Commonwealth is required to prepare a Management Plan (MP) for each site listed under the Ramsar Convention that are entirely in Commonwealth areas (s328 *EPBC Act*). The MP developed must not be inconsistent with Australia's obligations under the Ramsar Convention, or the Australian Ramsar management principles. The *EPBC Act* requires that the Commonwealth and Commonwealth agencies must not contravene these plans, and that the plans must be reviewed every 5 years (s331 *EPBC Act*).

For other Ramsar sites not under Commonwealth jurisdiction, the Commonwealth must use best endeavours to implement management plans for other wetlands listed under the Ramsar Convention, in cooperation with the relevant States and self-governing Territories (s333 *EPBC Act*). Management plans, other than those in Commonwealth areas, must be reviewed at intervals of not more than 7 years (Australian Ramsar management principles, Schedule 6, *EPBC Regulations*).

A summary table showing the questionnaire responses regarding current management plans and their status is illustrated in Table 3-8.

Based on information provided by questionnaire responses of site managers (question 13), DEW held the most recent MPs for 43 of the 64 listed sites (Figure 3-12). DEW held all of Victoria's most recent MPs, and >50% of NSW, South Australia, Tasmania and Commonwealth administered wetlands MPs. Of the Commonwealth sites, 1 site (site 59 – Coral Sea Reserves) had an outdated management plan (published in 2001). Of the other sites with MPs, nine sites had outdated MPs (over 7 years old).

MPs have been developed for all sites (covering part or all of the wetland) in Queensland, NSW, Victoria, ACT and the Commonwealth. MPs at sites within South Australia, Western Australia and Tasmania were in varying states of preparation, with six sites having a draft or in review MP, and two sites with a MP that was 'in preparation' (site 29 Riverland, declared 1987; and site 9 Flood Plain Lower Ringarooma River, declared 1982). Five sites did not have any form of MP; sites 7 (Apsley Marshes, declared 1982), 8 (East Coast Cape Barren Is Lagoons, declared 1982) and 10 (Jocks Lagoon, declared 1982) in Tasmania, and sites 55 (Lake Gore) and 56 (Muir-Byenup System) in Western Australia (both declared in 2001) (Table 3-8).

Overall, 33% of MPs were prepared specifically for the purposes of managing the entire Ramsar site (Ramsar specific), 64% were prepared in order to manage a broader area including the entire Ramsar site (General), and 4% of sites had plans that covered sub-sites but not the entire Ramsar site (sub-site only). All MPs for ACT and South Australian sites, and all but one site in Victoria (site 57 Edithvale-Seafood), were prepared specifically for the purposes of managing the Ramsar site (Figure 3-13). All MPs prepared for Queensland, Northern Territory and Commonwealth sites were prepared in order to manage, among other things, the entire Ramsar site. There were similar numbers of Ramsar-specific and general MPs for Tasmanian and NSW sites. Only two sites (site 28 (Macquarie Marshes) in NSW and site 36 (Peel-Yalgorup system) in Western Australia) were reported as having MPs that only covered sub-site/s (not the entire site) (Figure 3-13).¹³

The *EPBC Act* (section 335) and *EPBC Regulations* (Schedule 6) outlines the Australian Ramsar management principles. The principles provide a national standard for management, planning, environmental impact assessments, community involvement and monitoring of wetlands site that are consist with Australia's obligation under the Ramsar Convention. Under the Act, a Ramsar management plan must not be inconsistent with these principles.

A subset of the Australian Ramsar management principles from the *Regulations* were included in the questionnaire (determined in consultation with DEW) and site managers were required to indicate whether the site management plan complied with the management principles. Note that the principles listed in the questionnaire were modified to allow for interpretation by site managers and other stakeholders. The principles used in the questionnaire are outlined in Appendix H.

The questionnaire responses indicated that overall, there was 19% of the 64 (excluding site 65, Paroo River Wetland) MPs held by DEW that were seen to conform with the management principles listed in the questionnaire (Figure 3-14). Approximately 43% of MPs fulfilled between 50-99% of the requirements, and 11% of MPs met between 1-49% of the requirements. The remaining 27% of MPs did not meet any of the requirements according to the questionnaire respondents (Figure 3-14).

¹³ Updated comments from NSW since finalisation of the database indicate that management plans do in fact exist for each component of Site 28 (Macquarie Marshes) thus covering the entire site.

Nationally, five of the nine states or territories reported they had MPs that were fully consistent with the management principles set out in the questionnaire (Figure 3-15), with another 28 MPs reported as addressing 50% – 99% of the requirements (shown in light blue in Figure 3-15).

Table 3-8 Questionnaire responses regarding Ramsar Management Plans and their current status

Site No.	Location	Management Plan Title	Management Plan Status
45	ACT	Ginini Flats Wetlands Ramsar Site Plan of Management May, 2001	Finalised
40	EXT (Cwth)	Christmas Island National Park Management Plan 2002	Finalised
46	EXT (Cwth)	Pulu Keeling National Park Management Plan 2004	Finalised
58	EXT (Cwth)	Ashmore Reef Nature Reserve and Cartier Island Marine Reserve Management Plans 2002	Finalised
59	EXT (Cwth)	Coringa-Herald National Nature Reserve & Lihou Reef National Nature Reserve Management Plan 2001	Finalised
60	EXT (Cwth)	Elizabeth and Middleton Reefs marine National Nature Reserve Management Plan 2006	Finalised
61	EXT (Cwth)	Christmas Island National Park Management Plan 2002	Finalised
23	NSW	Towra Point Nature Reserve Plan of Management 2001	Finalised
24	NSW	Kooragang Nature Reserve and Hexham Swamp Nature Reserve Plan of Management 1998 and Shortland Wetlands Site Management Plan 2002-2009 2006	Finalised & Finalised
28	NSW	Individual Property Management Plan for the Wilgara Wetland Ramsar Site, March 2001 (revised August 2006), and Macquarie Marshes Nature Reserve Plan of Management 1993	Finalised & Finalised
47	NSW	Little Llangothlin Nature Reserve Management Plan 1998	Finalised
48	NSW	Plan of Management Kosciuszko National Park 2006	Finalised
49	NSW	Sturt National Park Management Plan 1996	Finalised
50	NSW	Individual Property Management Plans for the "Big Leather", "Crinolyn", and "Goddard's Lease" Wetland Ramsar Site, revised August 2006	All Finalised
52	NSW	Myall Lakes National Park Plan of Management 2002	Finalised
53	NSW	Narran Lakes Nature Reserve Plan of Management 2000	Finalised
62	NSW	Management Plan for Fivebough and Tuckerbil Swamps, Leeton, NSW 2002	Finalised
64	NSW	Management Plan for Murray Management Area 1987	Finalised
65	NSW		
1	NT	Gurig National Park Draft Plan of Management 1998	Draft
2	NT (Cwth)	Kakadu National Park Management Plan 2007-2014	Finalised
30	NT (Cwth)	Kakadu National Park Management Plan 2007-2014	Finalised
41	QLD	(1) SEQ Regional Coastal Management Plan 2006, (2) SEQ Regional Water Quality Management Strategy 2001, (3) SEQ Regional Plan 2005-2006, (4) Marine Park (Morton Bay) Zoning Plan 1997, (5) Shorebird Management Strategy - Morton Bay, (6) Marine Park (Morton Bay)	(1) Finalised, (2) Endorsed (3) Finalised (4) In review (5) Endorsed (7) Finalised
42	QLD	Bowling Green Bay National Park Management Plan (August 2001)	Finalised
43	QLD	Currawinya National Park Management Plan (February 2001):	Finalised
51	QLD	The marine Park (Great Sandy) Zoning Plan 2006	Finalised
44	QLD/ Cwth	Shoalwater Bay Training Area EMS 2006	In review
25	SA	Coorong, Lakes Alexandrina and Albert Ramsar Management Plan 2000	Finalised
26	SA	Bool Lagoon Fame Reserve and Hacks Lagoon Conservation Park Management Plan 2006	Finalised
27	SA	Coogie Lakes Ramsar Wetlands A Plan for Wise Use; Draft for Public Consultation 1999	Draft
29	SA	Riverland Ramsar Site: A Plan for Wise Use (draft plan in preparation with NAP funding 2004)	In preparation
63	SA	Management Plan for the Banrock Station Wetland Complex Wetland of International Importance, 2004	Finalised
10	TAS		
11	TAS		Draft
12	TAS	Waterhouse Conservation Area Draft Management Plan 2003 (NB approved 2004)	Finalised

3	TAS	Moulting Lagoon Game Reserve (Ramsar Site) Management Plan 2003 (NB approved 2004)	Finalised
4	TAS	Logan Lagoon Ramsar Site (part of the Laogn Lagoon Conservation Area) Management Plan 2004	Endorsed
5	TAS	Lavinia Nature Reserve (Ramsar Site) Draft Management Plan 2000	Draft
6	TAS	Pitt Water/ Orielton Lagoon Ramsar Site (including the Pitt Water Nature Reserve) Draft Management Plan 1999	Draft
7	TAS		
8	TAS		
9	TAS		In preparation
13	VIC	Corner Inlet Ramsar Site Strategic Management Plan 2003	Finalised
14	VIC	Barmah Forest Ramsar Site Strategic Management Plan 2002	Finalised
15	VIC	Gunbower Forest Ramsar Site Strategic Management Plan 2003	Finalised
16	VIC	Hattah-Kulkyne Lakes Ramsar Site Strategic Management Plan 2003	Finalised
17	VIC	Kerang Wetlands Ramsar Site Strategic Management Plan 2004	Finalised
18	VIC	Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site Strategic Management Plan 2003	Finalised
19	VIC	Western Port Ramsar Site Strategic Management Plan 2003	Finalised
20	VIC	Western District Lakes Ramsar Site Strategic Management Plan 2002	Finalised
21	VIC	Gippsland Lakes Ramsar Site Strategic Management Plan 2003	Finalised
22	VIC	Lake Albacutya Ramsar Site Strategic Management Plan 2003	Finalised
57	VIC	Edithvale – Seaford Wetlands Ramsar Management Plan 2000	Finalised
31	WA		
32	WA		
33	WA		
34	WA		
35	WA	Forrestdale Lake Nature Reserve: Management Plan 2005 and Thomsons Lake Nature Reserve: Management Plan 2005	Finalised & Finalised
36	WA	Lake McLarty Draft Management Plan 2005	Finalised
37	WA	Lake Toolibin Recovery Plan 1994	In review
38	WA	Busselton Wetlands Conservation Strategy 2005	Finalised
39	WA	Esperance Lakes Nature Reserves Management Plan 1999-2009	Finalised
54	WA	Rockingham Lakes Regional Park Draft Management Plan 2003-2013	Draft
55	WA		
56	WA		

Note: where the title or status has been left blank, no answer was provided by respondents.

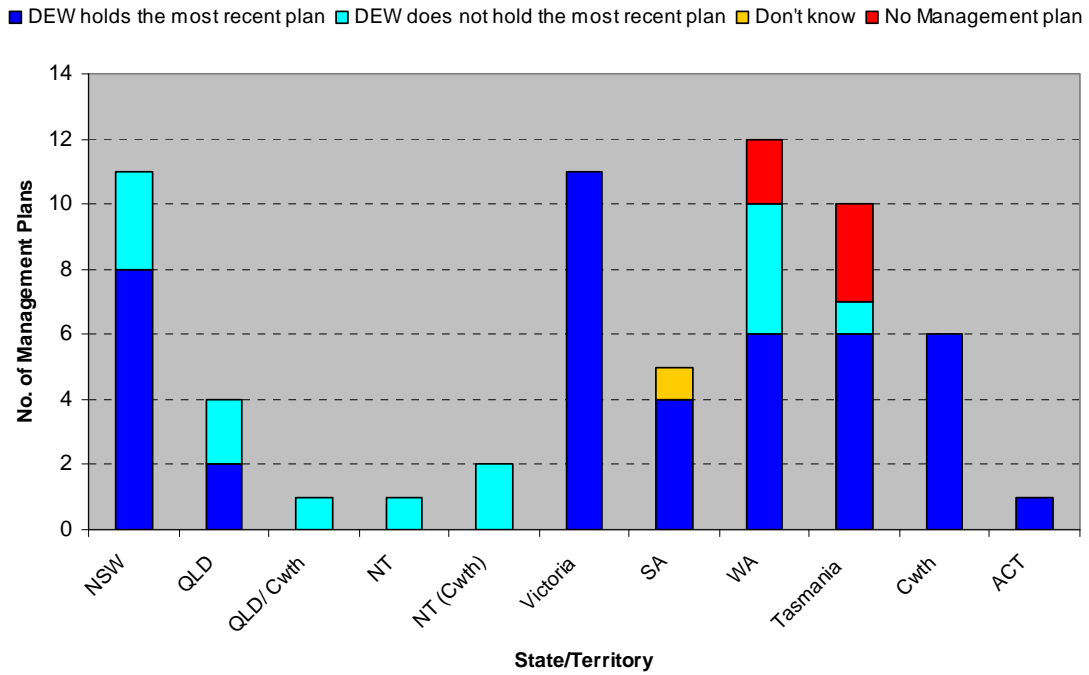


Figure 3-12 Status of Management Plans for Ramsar sites

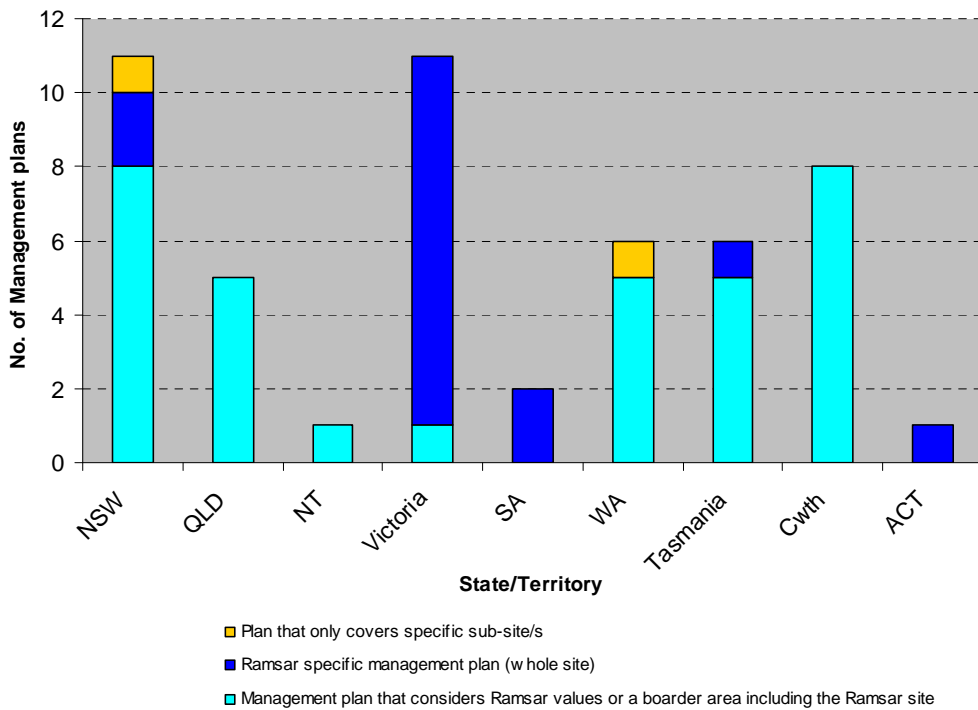


Figure 3-13 Number of management plans that are: (i) Ramsar specific management plan (whole site) (ii) Management plan that considers Ramsar values or a broader area including the Ramsar site (iii) Plan that only covers specific sub-site/s

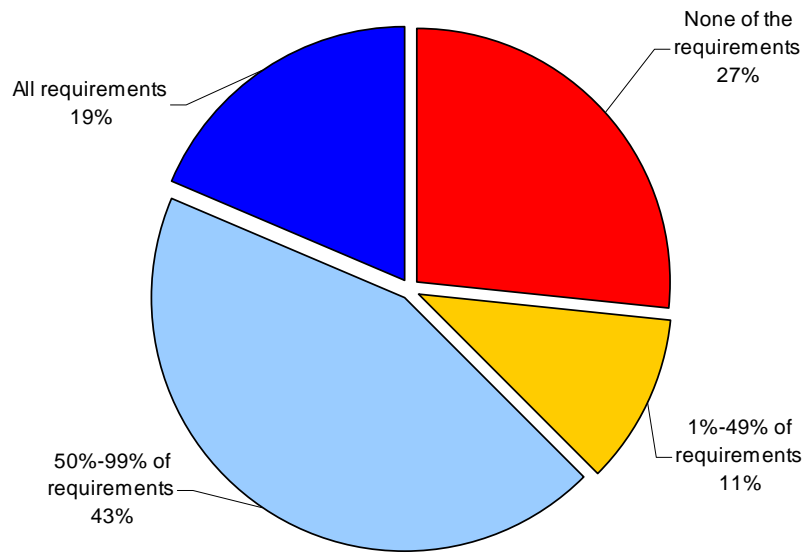


Figure 3-14 Percentage of management plans that are consistent with Ramsar management principles under the *EPBC Regulations* according to questionnaire responses

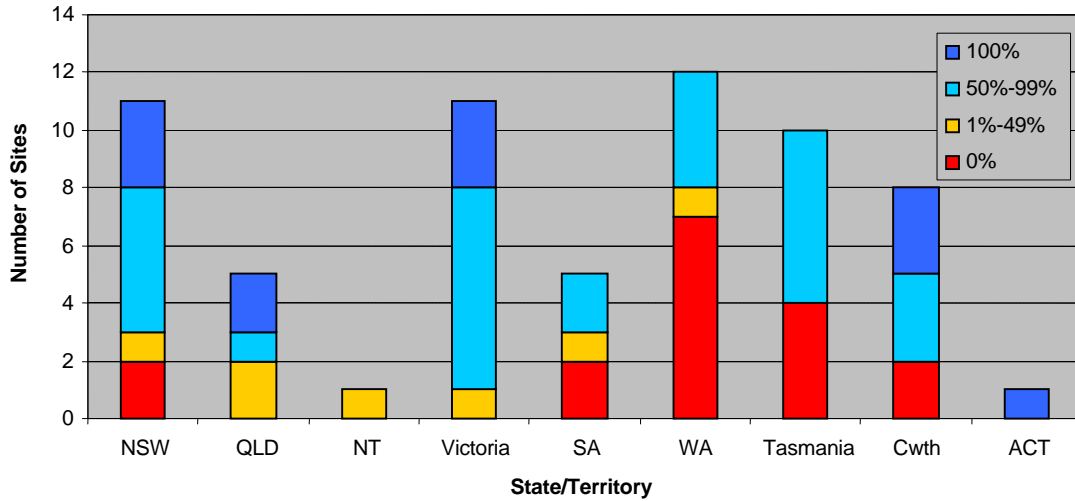


Figure 3-15 Percentage of management principles (as set out in the questionnaire) met by each management plan

3.3.2 Ramsar Information Sheets

All sites have a Ramsar Information Sheet (RIS) submitted at the time of listing. Contracting Parties to the Ramsar Convention must ensure the RIS is reviewed and updated if required every 6 years for the purposes of recording relevant data, and for provision of data to the Ramsar Secretariat (and uploading to the Wetlands International (WI) website). This information provides details of geographical coordinates, surface area, Ramsar wetland criteria for inclusion in Wetlands of International Importance list, wetland types, hydrological requirements, ecological characteristics, social-economic values, ownership (tenures), jurisdiction and conservation measures taken to maintain the ecological character of the site.

Based on comparison of information available from DEW and questionnaire responses from site managers (questionnaires), DEW held the most up-to-date¹⁴ RIS for 35 of the 64 listed Ramsar sites. This means that 54% of the RIS held by DEW are within the 6-year revision requirement (Figure 3-17, Table 3-9). Up-to-date RISs have been developed for all sites within WA and Tasmania (Figure 3-16) and the Queensland/Commonwealth administrated site 44 (Shoalwater and Corio Bay). The remaining sites had RISs of varying ages.

Overall DEW held more up-to-date RISs for Australia and its external territories than the WI website. The Ramsar Secretariat’s list of outdated RISs (on the Ramsar website) indicates that 47 of 64 Australian RISs are outdated. WI held up-to-date RISs for 9 Australian sites (14% of sites), with most RISs held by WI typically >9 years old (Figure 3-17; Figure 3-18).

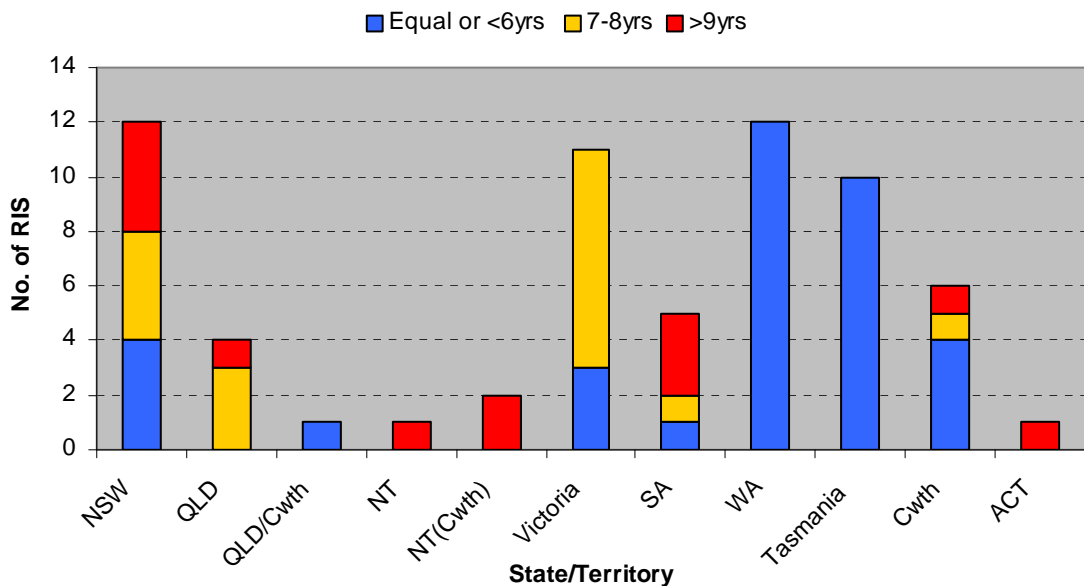


Figure 3-16 Number of up-to-date RIS held by DEW (i.e ≤6 years old)

¹⁴ RIS is less than 6 years old (eg. within the mandatory review period).

Table 3-9 Date of the most recent RIS at each site and the status of updated RIS currently in preparation.

Site No.	Location	Date of the latest RIS	Updated RIS in preparation	Status of update RIS	Years since latest RIS
45	ACT	06-Jan-99	No		8
40	EXT (Cwth)	29-Jun-98	No		9
46	EXT (Cwth)	06-Jan-99	No		8
58	EXT (Cwth)	10-Jan-02	No		5
59	EXT (Cwth)	09-Jan-02	No		5
60	EXT (Cwth)	01-Oct-02	No		5
61	EXT (Cwth)	10-Jan-02	No		5
23	NSW	01-Jan-98	Uncertain		10
24	NSW	10-Jan-02	Uncertain		5
28	NSW	01-Jan-00	Yes	Early draft	8
47	NSW	01-Jan-98	No		10
48	NSW	01-Jan-98	Uncertain		10
49	NSW	01-Jan-98	Uncertain		10
50	NSW	26-Mar-99	Uncertain		8
52	NSW	31-Mar-99	Uncertain		8
53	NSW	04-Jan-99	Yes	Early draft	8
62	NSW	10-Jan-02	Uncertain		5
64	NSW	10-Jan-02	No		5
65	NSW	30-Mar-06			1
1	NT	01-Jan-98	No		10
2	NT (Cwth)	01-Jan-98	No		10
30	NT (Cwth)	01-Jan-98	No		10
41	QLD	06-Jan-99	No		8
42	QLD	01-Jan-99	No		9
43	QLD	06-Jan-99	No		8
51	QLD	05-Jan-99	Yes	Draft, but not yet submitted	8
44	QLD/ Cwth	01-Jan-95	Yes		2
25	SA	11-Jan-00	Yes	Early draft	7
26	SA	01-Jan-98	Uncertain	Draft, submitted	10
27	SA	01-Jan-98	No		10
29	SA	01-Jun-07	Uncertain	Draft, submitted	10
63	SA	10-Jan-02	Uncertain		5
10	TAS	06-Jan-05	Yes	Draft, submitted	2
11	TAS	06-Jan-05	Yes	Draft, submitted	2
12	TAS	06-Jan-05	Yes	Draft, submitted	2
3	TAS	06-Jan-05	Yes	Draft submitted	2
4	TAS	06-Jan-05	Yes	Draft, submitted	2
5	TAS	06-Jan-05	Yes	Draft, submitted	2
6	TAS	06-Jan-05	Yes	Draft, submitted	2
7	TAS	06-Jan-05	Yes	Draft, submitted	2
8	TAS	06-Jan-05	Yes	Draft, submitted	2
9	TAS	06-Jan-05	Yes	Draft, submitted	2
13	VIC	05-Jan-99	Yes	Draft, not yet prepared	8
14	VIC	05-Jan-99	Yes	Draft but not yet submitted	8
15	VIC	05-Jan-99	Yes	Draft, but not yet submitted	8
16	VIC	04-Jul-05	Yes	Draft, but not yet submitted	2
17	VIC	03-Jan-06	Yes	Draft, but not yet submitted to Australian Government (DEW) but revised using previous	1

Site No.	Location	Date of the latest RIS	Updated RIS in preparation	Status of update RIS	Years since latest RIS
				Ramsar Convention RIS - needs to be updated to new RIS format	
18	VIC	05-Jan-99	Yes	Draft, but not yet submitted	8
19	VIC	05-Jan-99	Yes		8
20	VIC	05-Jan-99	No		8
21	VIC	05-Jan-99	Yes	Draft, not yet prepared	8
22	VIC	05-Jan-99	No		8
57	VIC	20-Jul-01	No		6
31	WA	11-Jan-03	No		4
32	WA	11-Jan-03	No		4
33	WA	10-Jan-03	No		4
34	WA	11-Jan-03	No		4
35	WA	11-Jan-03	No		4
36	WA	11-Jan-03	Yes	Early draft	4
37	WA	11-Jan-03	No		4
38	WA	09-Jan-04	Yes	Draft	3
39	WA	10-Jan-03	No		4
54	WA	09-Jan-03	No		4
55	WA	10-Jan-03	No		4
56	WA	11-Jan-03	No		4

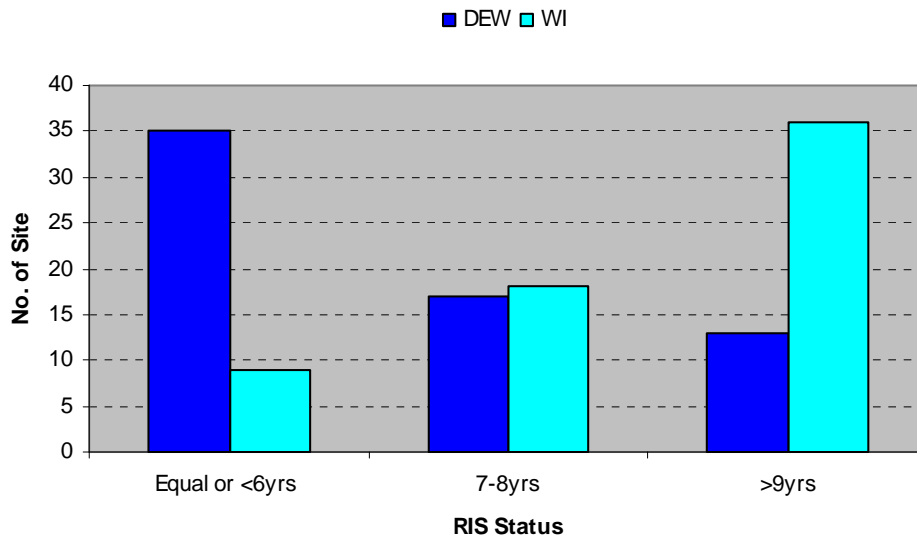


Figure 3-17 Status of RISs held by DEW and Wetland International (WI)

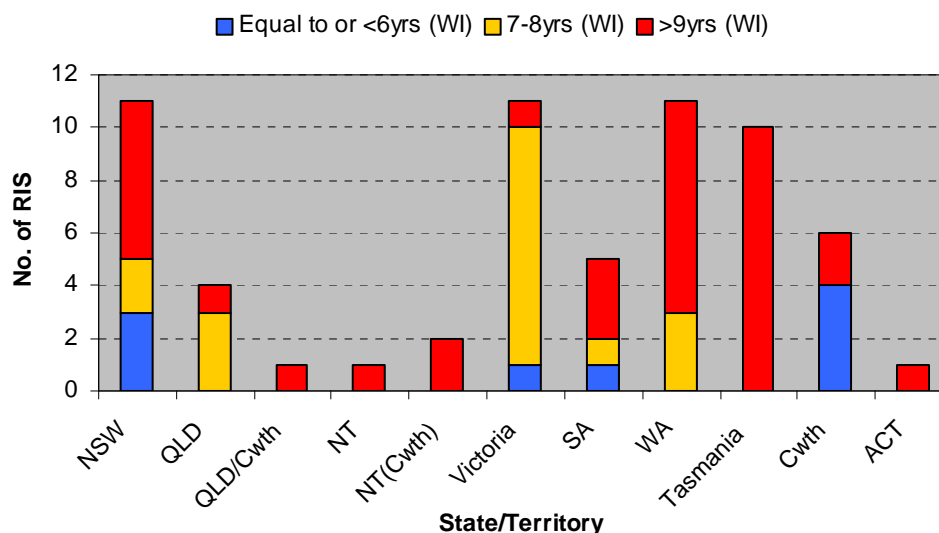


Figure 3-18 Age of RISs held by Wetland International

3.3.3 Ecological Character Description

The Australian Government and State/territory Governments are responsible for managing Ramsar wetlands within their jurisdiction and their ecological character, and those administrative programmes that ensure the conservation and wise use of these areas. The Australian Government addresses their obligations through the *EPBC Act*, which regulates actions that may cause a significant impact on, *inter alia*, the ecological character of a Ramsar wetland, and through development and implementation of national wetlands policies, guidelines and natural resource management programmes.

The Ramsar Convention states that Contracting Parties must manage Ramsar sites in a way that maintains the ecological character of the site, remain informed of any changes to the character of each site and notify the Ramsar Secretariat when changes to the ecological character of a Ramsar wetland occur. DEW has developed national guidelines to guide the development of Ecological Character Descriptions (ECDs) for Australian Ramsar wetlands. The ecological character description explains in detail the wetland processes, ecosystem components and benefits that characterise the site at any given point in time. Ecological character descriptions are being prepared for a number of Australian Ramsar sites. Since 2005, 13 ECDs have been prepared for Australian Ramsar sites, with the aim to eventually have an ECD for every Australian Ramsar site.

From information held by DEW and questionnaire responses, 12% of sites have finalised ECDs, with 20% and 15% in draft and in preparation stages respectively. Over half the Ramsar sites did not have an ECD at time of reporting (Figure 3-19). No State or Territory in Australia had finalised ECDs for all sites within their jurisdiction (Figure 3-20). Sites 24 and 28 from NSW had finalised ECDs for the private sub-site, and had 'in preparation' and draft ECDs for the other sub-sites within these two sites (Figure 3-20).

Site managers were requested to provide details regarding any formal or informal¹⁵ assessments (e.g. court case, peer reviewed multidisciplinary scientific study, etc) undertaken which examined changes in the ecological character of the wetland from baseline (i.e. conditions at time of listing). Overall, five sites have undertaken informal assessments which are useful in the context of assessing potential changes in ecological character:

- Site 17 (Kerang Wetlands). Ecological assessments were undertaken in 2000 for Lakes Tutchewop, William, Little Lake Kelly. Assessments considered the current and future use of these lakes as salinity disposal basins.
- Site 18 (Port Phillip Bay, Victoria). The Management Plan was reviewed by external consultants and community advisory committee in 2002. Note that Melbourne Water is now required to submit annual reports to the Commonwealth Department of Environment & Water Resources. Three annual reports have been submitted for 2004, 2005 and 2006.¹⁶
- Site 6 (Pittwater-Orielton Lagoon, Tasmania). A multi-disciplinary scientific study was undertaken in 1994 (no other details provided).
- Site 11 (Interlaken, Tasmania). A multi-disciplinary scientific study was undertaken in 1995.
- Site 53 (Narran Lake Nature Reserve, NSW). The Narran Ecosystem Science project (2004-2007) informally considered changes in ecological character.

To date, two sites have undertaken formal assessments of potential changes in the ecological character of the Ramsar wetland:

- Site 25 (Coorong, and Lakes Alexandrina and Albert Wetland, South Australia).
- Site 63 (Banrock Station Wetland Complex, South Australia). Note that the ecological character of the site has been addressed within the management plan.

¹⁵ For the purposes of this report, a formal assessment refers to any ecological assessment that has taken place since the original ECD, where as an informal assessment is any assessment that has taken place since the listing of the site and there is no ECD.

¹⁶ Note that there was a data inconsistency identified in relation to this site whereby DEW holds a final ECD but this was not identified as being the case in the questionnaire response.

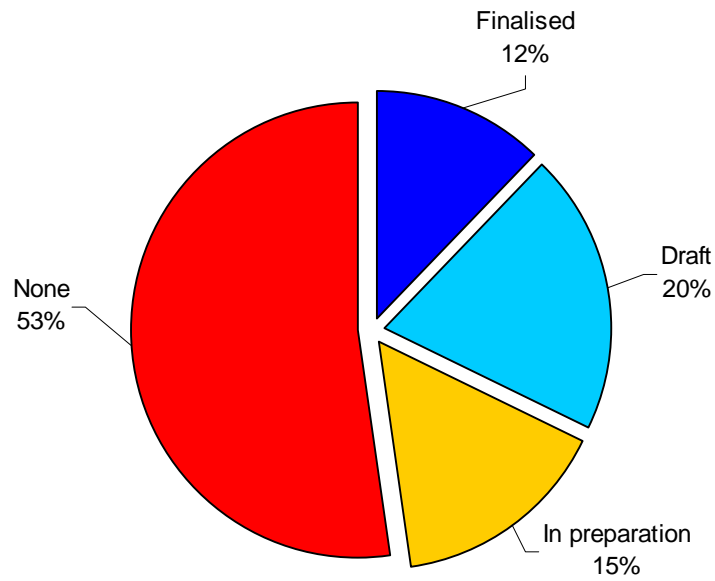


Figure 3-19 Status of ECD's for Australia's Ramsar wetlands

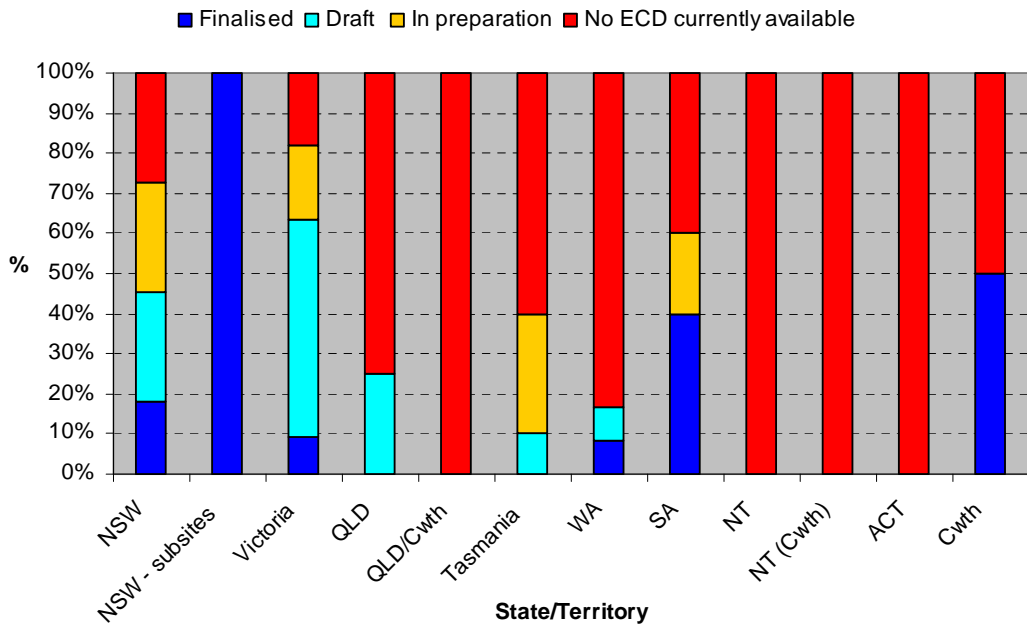


Figure 3-20 Status of ECD's within each state/territory

Table 3-10 Current ECD status and status of ecological assessment examining change in ecological character since designation

Site No.	Location	ECD Status			Assessment of changes to ecological character
		Finalised	Draft	In prep.	
58	Cwth	*			
59	Cwth	*			
60	Cwth	*			
13	Victoria			*	
19	Victoria		*		
18	Victoria	*(DEW)	*		Informal
17	Victoria		*		Informal
16	Victoria		*		
15	Victoria		*		
14	Victoria	*			
21	Victoria			*	
57	Victoria		*		
52	NSW			*	
53	NSW				Informal
48	NSW		*		
49	NSW		*		
28	NSW	#		*	
24	NSW	#	*		
53	NSW			*	
62	NSW	*			
50	NSW	*			
51	QLD		*		
26	SA	*			
25	SA	*			Formal
29	SA			*	
63	SA	*(DEW)			Formal
3	Tasmania			*	
6	Tasmania				Informal
8	Tasmania			*	
11	Tasmania			*	Informal
9	Tasmania		*		
13	Victoria			*	
21	Victoria			*	
37	WA	*			
38	WA		*	*	

* Ramsar Wetland.

Sub-site.

3.3.4 Spatial Data

Maps are an essential requirement of the Australian Government and Ramsar Convention, and are required to be provided to the Ramsar Secretariat (eg. Wetlands International) with the RIS (including updates every 6 years). The information is used to declare Ramsar wetlands under the Ramsar Convention and to access and record potential or actual areas of impacts occurring on the site under the *EPBC Act*. Spatial data and maps are also requirements for development of ECD and management plans.

Based on information received from site managers (questionnaires), 54 of the listed 64 sites (excluding site 65, Paroo River Wetland) indicate that both electronic copy and hard copy maps were available for the site (Figure 3-21, Table 3-11).

Overall, 97% of sites in Australia had access to an electronically formatted map. Two respondents (1 each from NSW and SA) were unsure of the types of maps available for that particular site.

Standards were developed during the questionnaire stages in conjunction with DEW in order to assess spatial (mapping) data quality. These standards are comparable, but not identical to, standards outlined in the recently published *Mapping Specifications for Australian Ramsar Wetlands* (DEW 2007). Respondents were requested to determine whether spatial data for their sites conformed to the derived spatial (mapping) data quality standards.

All sites within Western Australia, Tasmania, Northern Territory (Cwth), Queensland (Cwth) and Australian Capital Territory (ACT) held maps that conformed to these data standards. Maps for sites in Victoria, Queensland and Northern Territory did not conform to data standards. For New South Wales and South Australia, 5 sites conformed to standards, 3 sites did not conform to standards, and at 9 sites managers were uncertain whether maps conformed to the standards.

According to information supplied by DEW, the date recorded for the most recent version of the electronic boundary data for all sites was December 2006. Questionnaire responses by site managers indicated that DEW (Figure 3-23):

- held the most recent electronic boundary data for all sites within WA and the Commonwealth/External Territories, five sites in NSW, 2 sites in SA, and one site in Tasmania; and
- did not hold the most recent electronic boundary data in any of the Queensland or Victorian sites, and 1 site in South Australia.

The remaining respondents were unsure whether DEW held the most recent electronic boundary site data.

Overall, 92% of site managers had access to GIS facilities and were able to examine electronic boundary data. According to provisions listed in the *Mapping Specifications for Australian Ramsar Wetlands* (DEW 2007), maps should be prepared using GIS software and supplied in digital format in order for distribution and reproduction. Four sites from NSW and 2 sites from SA reported not having access to GIS facilities or were unsure whether the site managers had access to such facilities. These wetlands are site 24 (Hunter Estuary Wetlands), site 49 (Lake Pinaroo), site 50 (Gwydir Wetlands), site 62 (Fivebough and Tuckerbil Swamps), site 26 (Bool and Hacks Lagoon) and site 29 (Riverland). Following completion of data analysis, DEW confirmed that site managers of site 29 (Riverland) have access to GIS facilities. However, it was suggested that where there are multiple site managers for the different parts of the site, possibly only some have access to GIS facilities.¹⁷

¹⁷ There has been no third party verification in regards to whether or not the maps conform to the specifications outlined in the questionnaire.

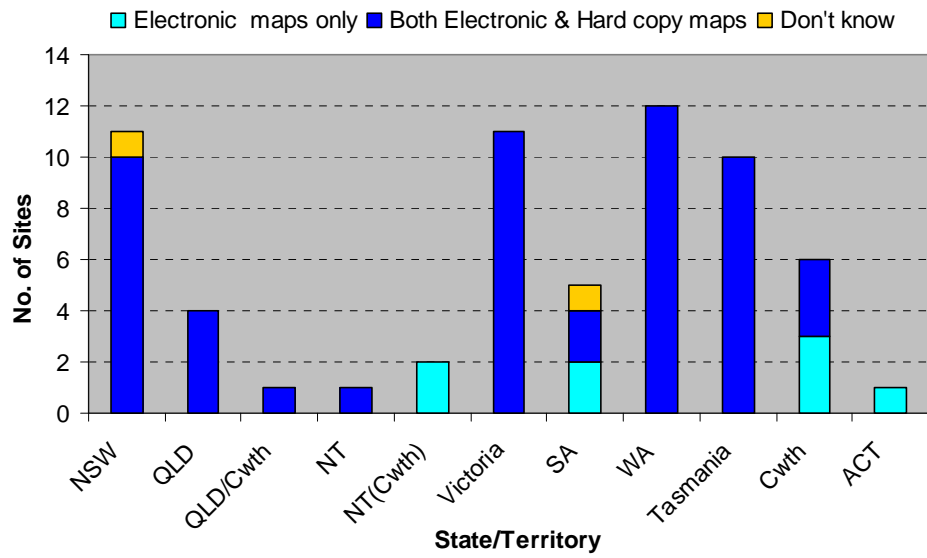


Figure 3-21 Types of maps available for Ramsar sites within each state/territory

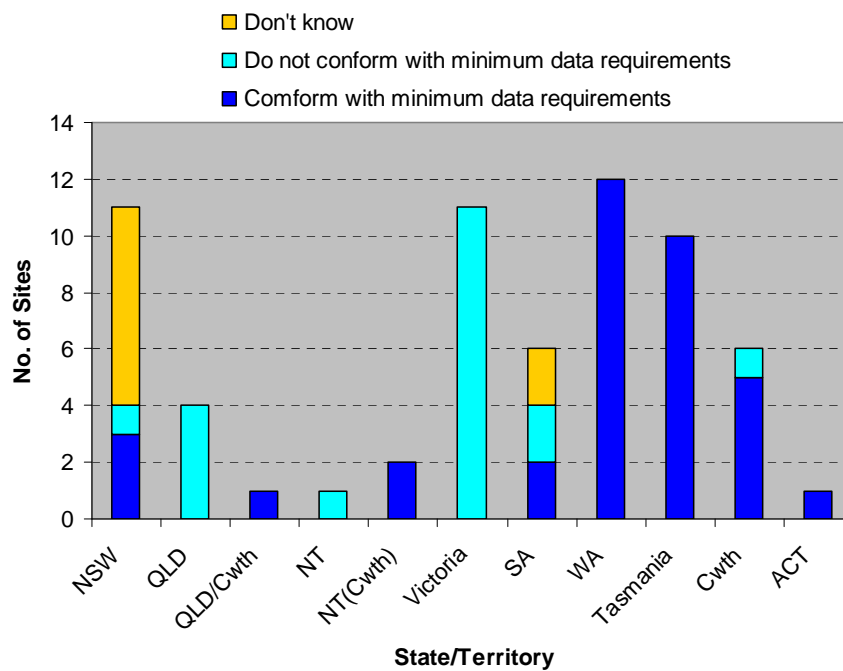


Figure 3-22 Number of Ramsar maps that conform to spatial data standards

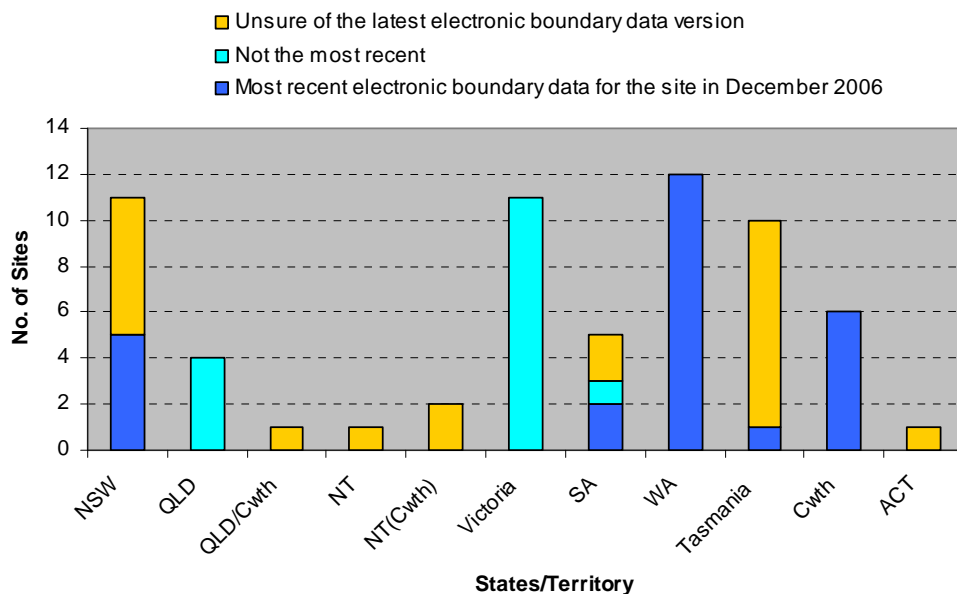


Figure 3-23 Number of Ramsar sites where DEW held the most recent version of the electronic boundary data

Table 3-11 Questionnaire responses regarding Ramsar maps and electronic boundary data.

Site No.	Location	Types of Maps Available	Date of most recent version of Electronic Boundary Data	Site Managers with Access to GIS Facilities
45	ACT	Electronic	December 2006	Yes
40	EXT (Cwth)	Both	December 2006	Yes
46	EXT (Cwth)	Electronic	December 2006	Yes
58	EXT (Cwth)	Electronic	December 2006	Yes
59	EXT (Cwth)	Electronic	December 2006	Yes
60	EXT (Cwth)	Both	December 2006	Yes
61	EXT (Cwth)	Both	December 2006	Yes
23	NSW	Both	December 2006	Yes
24	NSW	Both	December 2006	No
28	NSW	Both	December 2006	Yes
47	NSW	Both	December 2006	Yes
48	NSW	Both	December 2006	Yes
49	NSW	Uncertain	December 2006	No
50	NSW	Both	December 2006	No
52	NSW	Both	December 2006	Yes
53	NSW	Both	December 2006	Yes
62	NSW	Both	December 2006	Uncertain
64	NSW	Both	December 2006	Yes
65	NSW		December 2006	
1	NT	Both	December 2006	Yes
2	NT (Cwth)	Electronic	December 2006	Yes
30	NT (Cwth)	Electronic	December 2006	Yes
41	QLD	Both	1/1/2002	Yes
42	QLD	Both	1/11/2002	Yes

Site No.	Location	Types of Maps Available	Date of most recent version of Electronic Boundary Data	Site Managers with Access to GIS Facilities
43	QLD	Both	1/11/2002	Yes
51	QLD	Both	1/11/2002	Yes
44	QLD/ Cwth	Both	December 2006	Yes
25	SA	Both	December 2006	Yes
26	SA	Both	December 2006	Uncertain
27	SA	Electronic	December 2006	Yes
29	SA	Electronic	1/06/2007	Uncertain
63	SA	Uncertain	December 2006	Yes
10	TAS	Both	December 2006	Yes
11	TAS	Both	December 2006	Yes
12	TAS	Both	December 2006	Yes
3	TAS	Both	December 2006	Yes
4	TAS	Both	December 2006	Yes
5	TAS	Both	December 2006	Yes
6	TAS	Both	December 2006	Yes
7	TAS	Both	December 2006	Yes
8	TAS	Both	December 2006	Yes
9	TAS	Both	December 2006	Yes
13	VIC	Both	01/12/95-30/09/96	Yes
14	VIC	Both	01/12/95-30/09/96	Yes
15	VIC	Both	01/12/95-30/09/96	Yes
16	VIC	Both	01/12/95-30/09/96	Yes
17	VIC	Both	01/12/95-30/09/96	Yes
18	VIC	Both	01/12/95-30/09/96	Yes
19	VIC	Both	01/12/95-30/09/96	Yes
20	VIC	Both	01/12/95-30/09/96	Yes
21	VIC	Both	01/12/95-30/09/96	Yes
22	VIC	Both	01/12/95-30/09/96	Yes
57	VIC	Both	2001	Yes
31	WA	Both	December 2006	Yes
32	WA	Both	December 2006	Yes
33	WA	Both	December 2006	Yes
34	WA	Both	December 2006	Yes
35	WA	Both	December 2006	Yes
36	WA	Both	December 2006	Yes
37	WA	Both	December 2006	Yes
38	WA	Both	December 2006	Yes
39	WA	Both	December 2006	Yes
54	WA	Both	December 2006	Yes
55	WA	Both	December 2006	Yes
56	WA	Both	December 2006	Yes

3.3.5 Water Requirements

The Ramsar Convention recognises that, for the conservation and wise-use of these resources, it is essential that water allocation be managed at a broad contextual scale. Furthermore, at the 6th Meeting of the Conference of Contracting Parties (Brisbane 1996), it was identified that wetlands need to be integrated into water management policy. The *EPBC Act and Regulations* (Schedule 6)

addresses these issues through requirements that management for a declared Ramsar wetland (through a management plan) should be based on an 'integrated catchment management approach'.

To develop appropriate plans, policy developers must have an understanding and knowledge of the water requirements for the wetland. It should be noted that the Ramsar website provides a number of publications (including guidelines and frameworks) on water allocation and river basin (catchment) management.

Data supplied by DEW and site managers indicate that (Figure 3-24; Table 3-12):

- the water requirements were described as 'well known' at 11 sites (i.e. sites in NSW, WA and Victoria);
- water requirements were 'partly known' for another 15 sites (NSW, Victoria, SA, Tasmania, QLD/Cwth and QLD);
- the site manager/s were unsure of the answer at one site in NSW, 2 sites from SA, 2 sites in NT (Commonwealth), and 1 site in Commonwealth; and
- the water requirements were largely unknown for most of the remaining sites.

These results indicate that there is a fundamental knowledge gap in the key environmental driver of most (inland) Australian Ramsar sites. As discussed in section 0, hydraulic stress is thought to represent the main impacting process within most of Australia's Ramsar inland and inland/marine wetlands.

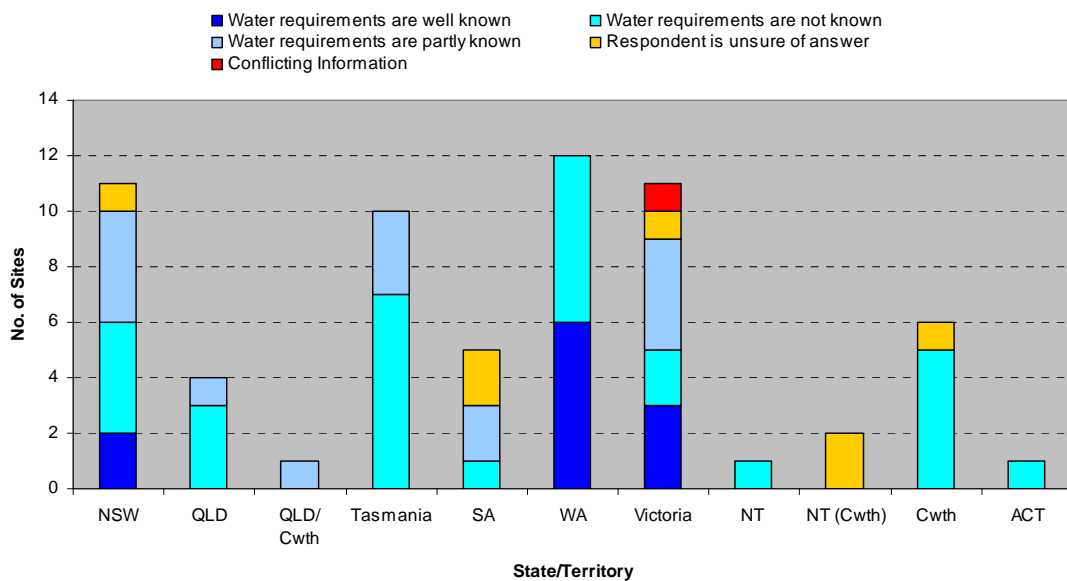


Figure 3-24 Number of Ramsar sites where the water requirements are known

Table 3-12 Responses to questionnaire questions regarding Ramsar wetland water requirements

Site no.	Location	Water requirements known?	Water requirements incorporated into water resource planning?	Management arrangements in place that address water sharing at the site or catchment level?
40	EXT (Cwth)	No	No	No
46	EXT (Cwth)	No	No	No
58	EXT (Cwth)	No	No	No
59	EXT (Cwth)	No	No	No
60	EXT (Cwth)	Uncertain	Uncertain	Uncertain
61	EXT (Cwth)	No	No	No
	QLD	No	41	Yes
42	QLD	No	No	Yes
44	QLD/ Cwth	Partially	Yes	Yes
51	QLD	No	No	Yes
13	VIC	Uncertain	Uncertain	Uncertain
18	VIC	C	C	Uncertain
19	VIC	No	No	No
20	VIC	No	Uncertain	No
21	VIC	Partially	Yes	Yes
23	NSW	No	No	No
24	NSW	No	No	No
26	SA	Partially	Uncertain	Uncertain
47	NSW	Partially	Uncertain	Uncertain
48	NSW	Uncertain	No	No
52	NSW	No	No	No
57	VIC	Partially	No	No
3	TAS	No	No	No
4	TAS	No	Uncertain	Yes
5	TAS	No	No	No
6	TAS	Partially	Uncertain	Uncertain
7	TAS	No	No	No
8	TAS	No	No	No
9	TAS	Partially	No	No
10	TAS	No	No	No
11	TAS	Partially	Yes	Yes
12	TAS	No	No	No
14	VIC	Yes	Yes	Yes
15	VIC	Yes	Yes	Yes
16	VIC	Partially	Yes	Uncertain
17	VIC	Partially	Yes	Yes
22	VIC	Yes	Yes	Yes
28	NSW	Partially	Uncertain	Yes
29	SA	No	No	Uncertain
25	SA	Partially	No	Yes
43	QLD	Partially	No	Yes
45	ACT	No	No	No
50	NSW	Partially	Uncertain	Yes
53	NSW	Yes	No	Yes
62	NSW	Partially	No	No
63	SA	Uncertain	Uncertain	Uncertain
64	NSW	Yes	Yes	Yes
35	WA	Yes	Yes	Yes
36	WA	Yes	Yes	Yes
37	WA	Yes	Yes	Yes
38	WA	No	No	Yes
39	WA	Yes	Yes	Yes
54	WA	No	No	No
55	WA	No	No	Yes
56	WA	No	No	No
1	NT	No	Yes	No
2	NT (Cwth)	Uncertain	Uncertain	Uncertain
30	NT (Cwth)	Uncertain	Uncertain	Uncertain
31	WA	Yes	Yes	Yes
32	WA	Yes	Yes	Yes
27	SA	Uncertain	Uncertain	Uncertain
49	NSW	No	No	No
33	WA	No	No	No
34	WA	No	No	No

3.3.6 Financial Analysis

The *EPBC Act* makes provision for Commonwealth financial (and other) assistance for protecting declared Ramsar wetlands (s336 *EPBC Act*). The Commonwealth *may* give financial or other assistance for the purposes of protecting or conserving a declared Ramsar wetland to a state/territory in which the wetland occurs, or any other person.

The general approach of the study was to undertake a broad analysis of NHT and NAP funding within the DEW/DAFF database with added information provided as part of questionnaire responses. As such, it is acknowledged that these data are likely to be incomplete in terms of total investment in Ramsar site management.

Financial Database Interrogation

Interrogation of the financial database held by DEW/DAFF did not allow quantification of the expenditure on Ramsar sites to date. The database report provided from the search term/keyword "Ramsar" was found to have extracted data on whole projects, of which a part may be related to a Ramsar site.

Based on the "Ramsar" search term, a total of \$21,291,998 has been allocated to the 159 funding events relevant to this search term since the 1997/1998 financial year (Table 3-13). Note that the figure (\$3,294,974) for the final year (2007/2008) represents only partial spending for that financial year because the database interrogation was performed in June 2006 when funding had already begun to be allocated for the following year.

Table 3-13 Funding for Financial Years Ending 1998-2008 (based on “Ramsar” as the search term)

Financial Year	Amount (\$)	Funding Programmes where \$ spent
1997/1998	21,620	Coded as “Other Fundings” (21,620)
1998/1999	192,900	Other Fundings (192,900)
1999/2000	174,550	Other Fundings (174,550)
2000/2001	261,280	Other Fundings (261,280)
2001/2002	868,346	Other Fundings: 227,250 NAP: 641,096
2002/2003	2,165,240	Envirofund: 174,523 NHT: 1,530,667 NAP: 460,050
2003/2004	1,643,357	Envirofund: 124,972 NHT: 1,076,785 NAP: 441,600
2004/2005	2,242,486	Envirofund: 82,337 NHT: 1,672,499 NAP: 487,650
2005/2006	3,752,824	Envirofund: 0 NHT: 2,627,003 NAP: 1,125,821
2006/2007	6,674,421	Envirofund: 111,552 NHT: 4,252,840 NAP: 2,310,029
2007/2008	3,294,974	Envirofund: 0 NHT: 3,077,746 NAP: 217,228
TOTAL	21,291,998	

Note: Envirofund is a subset of NHT, but has been represented separately in this table (NHT + Envirofund = 100% NHT).

For the purposes of the broken down costs in Table 3-13, NHT includes investment coded under the NHT1 and several NHT2 programmes such as Nature Reserves Program, Priority Action Funding, National investment stream, the regional investment strategy and regional competitive component. NAP includes funding under the NAP priority action funding and regional investment strategy.

Of the 159 results where the search term “Ramsar” received a ‘hit’, 152 were funded through NHT2/NAP (equating to \$20,414,398), and 7 were funded through NHT1 (equating to \$877,600). For analysis purposes, the 159 results were categorised into:

- Works: including restoration or rehabilitation works, fencing, vegetation management, and erection of signage.

- Management: refers to administrative management including documentation (e.g. development of management plans, work plans, new Ramsar site nominations), database management, landholder/stakeholder negotiations/incentive arrangements, meetings/workshops and resourcing.
- Research: including ecological investigations, monitoring, data collation, reviews and publications (e.g. books on wader birds).
- Acquisition: including of properties within or adjacent to a Ramsar site.

Note that where more than one category was applicable for a single funding event, the category to which the application description most aptly applied was used for the purposes of analysis.

The results were further separated into funding events for activities applicable to:

- *Only* Ramsar sites: applied to single Ramsar sites, areas within a Ramsar site or multiple Ramsar sites.
- Other areas where funded activities may impact on, or be in close proximity (within the catchment, a tributary, adjacent) to a Ramsar site, or to broad areas including Ramsar site/s.

Table 3-14 illustrates the number of funding events within each category that were applicable to only Ramsar sites or other sites. For all categories, there were more funding events that applied to other sites (e.g. catchment, tributaries) and to areas including the Ramsar site/s.

**Table 3-14 Numbers of funding events for Ramsar and other sites within each category
FYE1998-2008**

Category	Ramsar	Other
Acquisition	0	4
Works	14	33
Management	37	39
Research	12	20

Table 3-15 highlights the amount of funding that applied to *only* Ramsar sites within the “Ramsar” database interrogation. Both Works and Management in Ramsar sites were allocated a quarter of funding of all sites resulting from the “Ramsar” search. In contrast, very low proportions of funding were allocated for acquisition and research applicable to only Ramsar sites (0% and 8% respectively).

Table 3-15 Funding for Ramsar and other sites within each category FYE1998-2008 and the proportion of funding allocated to *only* Ramsar sites

Category	Ramsar	Other	Ramsar Total
Acquisition	\$ 0	\$ 409,408	0%
Works	\$ 970,729	\$ 3,061,548	24%
Management	\$ 2,836,066	\$ 8,945,436	24%
Research	\$ 381,849	\$ 4,686,962	8%
Total	\$ 4,188,644	\$17,103,354	20%

Results from the “Ramsar” key-word search indicated there could be extensive funding events within the database related to Ramsar sites (e.g. impacting on Ramsar sites and their management, conservation or wise-use from inside or outside the site, or impacting on species associated with Ramsar sites such as wader birds) but listed without using the word “Ramsar”. As a result, further interrogation of the database was conducted using the following search terms:

- Wetland
- Wetland AND (waders OR shorebirds OR waterbirds OR shore birds OR water birds)
- (Wetland OR lagoon OR marsh OR lake OR bay OR estuary) AND (management OR conservation OR restoration OR rehabilitation OR stewardship)
- Wetland AND "wise use" AND conservation
- Wetland AND ("water shar" OR "water plan" OR "water quality")¹⁸

Table 3-16 illustrates the search terms used, the number of results and the number of results including “Ramsar” in the Application Title and Application Description. It also outlines the amount of funding allocated from 2003-2008 financial years for each search term.

A number of search terms that included the same term (e.g. *marsh* management, *marsh* restoration and *marsh* stewardship) provided the same number of ‘hits’ that included “Ramsar” in the Application Title or Description (Table 3-16). Closer examination revealed that the same results reoccurred within searches using “marsh”. Similar results were found for search terms “estuary” and “lagoon”.

Overall, these combinations of broad search terms did not provide for additional relevant results to be easily extracted from the financial database. The extensive number of broad wetland projects encountered through the use of broad search terms highlighted that further refinement of the database fields is necessary to ensure meaningful results can be obtained from database searches on Ramsar expenditure in future for long-term management purposes.

Whilst the current database has been constructed in a way that could enable information specific to Ramsar sites to be retrieved, it is not easily available from past data. It is noted it is difficult to predict in advance the sort of information that may be needed in the future. A significant investment would need to be made to review and re-enter all past funding programmes, to allow for funding to be separated into various relevant categories to Ramsar expenditure. The historic data, for the purposes of the Ramsar Snapshot interrogation, is therefore considered incomplete.

¹⁸ Wetlands and “water share” not included in analysis due to incorrect use in database interrogation.

Table 3-16 Results from broad search terms used in DEW/DAFF financial database interrogation

Search terms	No. results	No. results with 'Ramsar'	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007	2007/2008	Total
Wetland	739	Approx 144	11,989,300	9,640,351	22,879,293	26,393,377	27,500,698	17,956,542	116,359,561
Wetland wise use conservation	358	Not counted	2,799,726	2,401,447	6,863,698	6,614,991	6,528,469	5,094,278	30,302,609
Wetland management	451	Not counted	5,961,538	6,732,081	18,397,439	19,063,914	16,602,057	10,602,813	77,359,842
Wetland conservation	406	Not counted	5,740,182	3,909,255	13,566,750	13,841,599	10,740,209	8,788,630	56,586,625
Wetland rehabilitation	378	Not counted	3,940,402	3,211,747	6,875,876	6,614,991	6,930,917	5,504,279	33,078,211
Wetland restoration	380	Not counted	3,682,346	2,543,662	6,932,876	8,121,991	6,528,469	5,094,278	32,903,622
Wetland stewardship	361	Not counted	2,799,726	2,446,447	6,933,698	6,699,961	6,528,469	5,094,278	30,502,579
Wetland wader	366	Not counted	2,964,726	2,405,847	6,920,698	6,722,991	6,528,469	5,094,278	30,637,009
Wetland shore bird	368	Not counted	2,799,726	2,538,122	9,111,019	8,431,843	8,237,781	6,289,278	37,407,769
Wetland water bird	370	Not counted	3,419,296	2,457,197	6,903,844	6,623,167	6,528,469	5,094,278	31,026,251
Wetland water plan	407	Not counted	3,269,803	4,126,653	12,793,994	11,957,276	12,462,306	8,802,249	5,3412,281
Wetland water quality	405	Not counted	5,141,324	2,849,085	8,987,607	9,243,965	9,419,816	7,844,980	43,486,776
Bay management	142	Not counted	1,091,539	1,788,593	2,615,495	2,334,175	2,760,062	4,113,561	14,703,425
Bay conservation	128	Not counted	812,154	1,881,420	2,168,627	2,118,825	1,910,019	2,653,869	11,544,916
Bay rehabilitation	117	Not counted	655,109	1,617,286	1,902,913	1,669,131	1,698,563	2,664,805	10,207,808
Bay restoration	118	Not counted	683,291	1,590,650	1,914,877	1,696,631	1,636,730	2,491,865	10,014,044
Bay stewardship	115	Not counted	655,109	1,590,650	1,902,913	1,669,131	1,525,667	2,088,765	9,432,236
Estuary management	92	2	1,208,896	1,390,481	6,690,248	6,353,418	5,912,021	5,696,088	27,251,152
Estuary conservation	50	2	447,906	979,493	2,585,712	2,935,936	3,529,586	3,792,303	14,270,935
Estuary rehabilitation	48	2	470,860	979,493	812,509	677,364	1,180,732	1,459,951	5,580,908
Estuary restoration	49	2	470,860	979,493	804,212	856,764	1,296,732	1,459,951	5,868,011
Estuary stewardship	46	2	447,906	979,493	804,212	677,364	1,180,732	1,459,951	5,549,657
Lagoon management	63	4	833,139	916,883	220,569	115,186	301,488	183,001	2,570,267
Lagoon conservation	59	4	661,432	614,428	185,381	270,458	316,216	383,552	2,431,467
Lagoon rehabilitation	57	4	669,451	428,428	171,387	55,186	115,040	No data	1,439,493
Lagoon restoration	55	3	661,432	401,792	171,387	55,186	115,040	No data	1,404,838
Lagoon stewardship	55	3	661,432	401,792	171,387	55,186	115,040	No data	1,404,838
Marsh management	32	4	715,656	352,948	2,171,440	1,923,500	1,793,203	1,730,000	8,686,747
Marsh conservation	33	5	805,656	324,348	2,063,576	1,783,500	1,799,294	1,730,000	8,506,375
Marsh rehabilitation	27	5	614,641	37,257	275,940	2,000	418,203	227,000	1,575,041
Marsh restoration	25	4	614,641	37,257	275,940	2,000	218,203	No data	1,148,041
Marsh stewardship	25	4	614,641	37,257	275,940	2,000	218,203	No data	1,148,041

Note: (1) Search completed 10/8/07; (2) "and/or" removed from search term.

Questionnaire Results

Due to the lack of information available from the financial database interrogation, the questionnaire also provided a form of interrogation on finances received for the various Ramsar sites. Based on questionnaire responses, ~35% of financial funding for Ramsar sites in Australia is in the form of State Government funding programmes, followed by NHT Regional (20% of total funding) and other Australian Government (18% of total funding) funding respectively (Figure 3-25). The remaining 27% of funding was more or less equally distributed among Local Government, private, owner contributions, corporate contributions and other sources.

Comparison of the information received from questionnaire responses found that most states or Territories receive funding NHT, NAP and Australian Government funding (Figure 3-26). Sites within Tasmania, South Australia, Victoria, Queensland and NSW were identified as receiving additional funding outside Government initiatives. Note that no financial information was supplied for some sites within NSW, Tasmania, QLD/Cwth and SA (Table 3-17).¹⁹

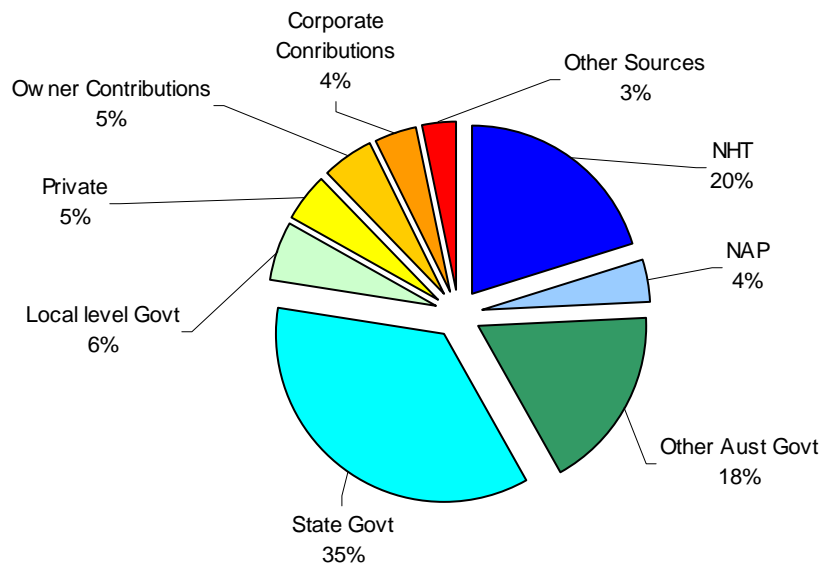


Figure 3-25 Percentage of funding to Australian Ramsar estate derived from different sources

¹⁹ NSW officials have since provided updated information that both Lake Pinaroo and Myall Lakes Ramsar sites have received funding for ECD studies in 05/06 and 06/07.

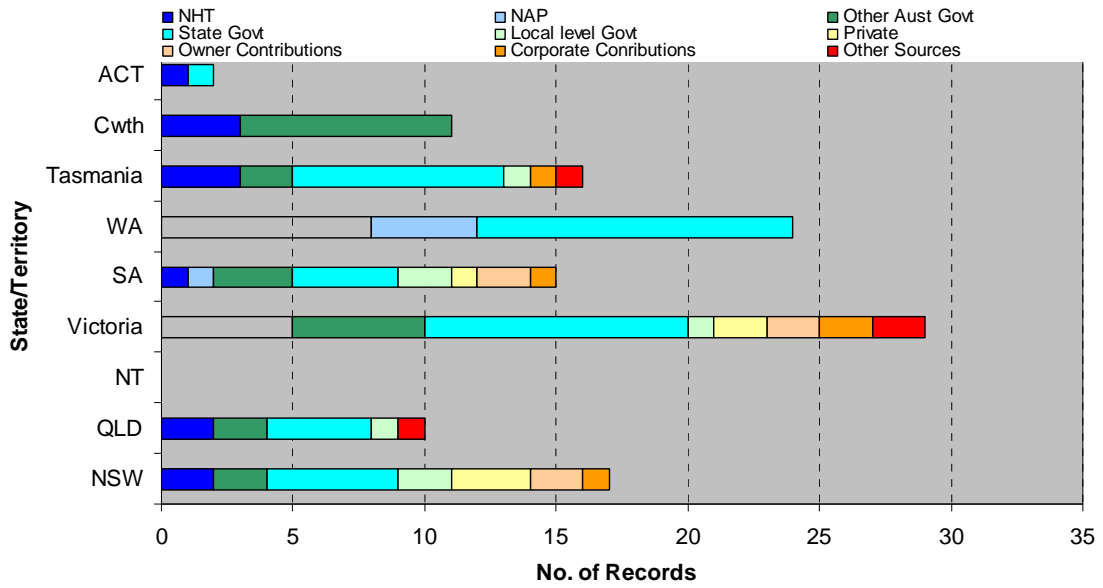


Figure 3-26 Types of funding for Ramsar wetlands for each State and Territory

Table 3-17 Sites where there are information gaps regarding financial funding arrangements

DEW Site No.	Location	Wetland Name
1	NT	Cobourg Peninsula
7	Tasmania	Apsley Marshes
10	Tasmania	Jocks Lagoon
23	NSW	Towra Point Nature Reserve
27	SA	Coongie Lakes
44	QLD/Cwth	Shoalwater and Corio Bays Area
49	NSW	Lake Pinaroo (Fort Grey Basin)
52	NSW	Myall Lakes
62	NSW	Fivebough and Tuckerbil Swamps