

Appendix 1. Summary analysis of Directory sites by Wetland types and Criteria for inclusion

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Wetland Types

THE WETLAND CLASSIFICATION SYSTEM USED IN THE DIRECTORY, which identifies 40 different wetland types in three categories: A—Marine and Coastal Zone wetlands, B—Inland wetlands, and C—Human-made wetlands, is described in Chapter 2.

The sites listed in the Directory may be of only one wetland type, but more often they comprise a number of wetland types; 505 of the 851 wetlands (59.3%) exhibit multiple wetland types (refer to Table A1.1). This is the case for all jurisdictions except the ACT, where five out of 13 (38.5%) wetlands show multiple types, and Tasmania, where five out of 89 (5.6%) sites listed show multiple wetland types. Amongst the other jurisdictions the average proportion of listed sites with multiple wetland types is 70.2%.

Table A1.1 Number of Directory sites in each jurisdiction with multiple Wetland types

	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	EXT	Total
Total no. sites	13	178	33	181	69	89	159	120	9	851
No. sites with multiple wetland types	5	97	27	154	54	5	78	78	7	505
% sites with multiple wetland types	38.5	54.5	81.8	85.1	78.3	5.6	49.1	65.0	77.8	59.3

All 40 wetland types are represented in the Directory. Queensland (37) and New South Wales (36) have the most comprehensive range of wetland types. The Australian Capital Territory (8) and the External Territories (14) have the least by virtue of size and geographical location.

Of the three categories, the Inland wetlands are the most recorded, being represented 1570 times in the wetlands listed in the Directory. Marine and Coastal Zone wetlands occur 1088 times, and Human-made wetlands occur least, being recorded 90 times. The four most commonly reported types are all Inland wetlands. The breakdown of sites in each wetland type by jurisdiction is detailed in Tables A1.2, A1.3 and A1.4.

**Table A1.2 Number of Directory sites in each Wetland type by jurisdiction:
A—Marine and Coastal Zone wetlands**

State	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
ACT	0	0	0	0	0	0	0	0	0	0	0	0
NSW	3	20	1	9	13	31	24	33	31	16	23	15
NT	3	4	1	0	1	14	13	11	13	1	1	0
QLD	43	42	11	22	52	51	56	51	64	28	35	23
SA	16	11	0	4	13	12	17	13	9	3	3	0
TAS	4	2	0	3	2	5	1	4	1	13	20	0
VIC	6	6	0	3	8	7	9	16	3	14	13	0
WA	3	5	0	2	5	9	14	10	10	5	0	1
EXT	1	3	6	2	6	0	2	0	1	1	1	0
Total	80	93	19	45	100	129	136	138	132	81	96	39

The most common of the 12 Marine and Coastal Zone wetland types are A8—Intertidal marshes (n=138), A7—Intertidal mud, sand or salt flats (n=136), A9—Intertidal forested wetlands (n=132) and A6—Estuarine waters (n=129) (refer to Table A1.2). These four wetland types account for 49% of the total of 1088 representations of Marine and Coastal Zone wetlands. The least well represented wetland type in this category is A3—Coral reefs (n=19), which accounts for just 1.75% of the representation. The other two poorly represented wetland types are A12—Non-tidal freshwater forested wetlands (n=39, 3.6%) and A4—Rocky marine shores (n=45, 4.1%).

**Table A1.3 Number of Directory sites in each Wetland type by jurisdiction:
B—Inland wetlands**

State	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19
ACT	3	1	0	1	0	0	0	0	3	6	0	0	0	0	3	0	0	0	0
NSW	10	25	2	23	16	44	7	8	18	34	1	2	31	26	26	2	1	0	0
NT	14	7	1	11	1	12	0	2	6	15	0	0	9	17	0	0	2	0	0
QLD	49	72	0	56	40	54	5	13	45	65	2	9	48	62	10	0	13	1	2
SA	11	6	1	15	10	15	10	9	7	5	4	4	7	4	7	0	4	0	2
TAS	11	0	0	0	9	2	3	2	3	0	0	0	0	0	13	0	0	0	0
VIC	25	6	0	23	20	19	27	22	5	30	3	16	11	17	8	0	0	0	0
WA	18	18	0	6	12	15	19	23	8	25	2	16	13	28	11	0	11	0	5
EXT	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	2	0	0
Total	141	135	4	135	108	164	71	79	95	180	12	47	119	155	79	3	33	1	9

Amongst the 19 Inland wetland types, the three most numerous are B10—Seasonal/intermittent freshwater ponds and marshes (n=180), B6—Seasonal/intermittent freshwater lakes (n=164), and B14—Freshwater swamp forest (n=155) (refer to Table A1.3). These three types make up 31.8% of the total of 1570 representations of inland wetlands in the Directory. The least represented type is B18—Geothermal wetlands with just one site in Queensland. In addition to B18, four other wetland types are represented by less than 1%: B3—Inland deltas (permanent) (n=4), B11—Permanent saline/brackish marshes (n=12),

B16—Alpine and tundra wetlands (n=3), and B19—Inland, subterranean karst wetlands (n=9). Wetland type B17—Freshwater springs, oases and rock pools is also under-represented (n=33, 2.1%).

Table A1.4 Number of Directory sites in each Wetland type by jurisdiction:
C—Human-made wetlands

State	C1	C2	C3	C4	C5	C6	C7	C8	C9
ACT	1	0	0	0	0	1	0	0	0
NSW	7	1	0	1	1	1	1	1	0
NT	2	1	0	0	0	0	0	0	0
QLD	15	9	2	1	1	3	3	3	0
SA	1	0	0	3	0	1	0	0	0
TAS	1	0	0	2	0	0	0	0	0
VIC	8	2	0	5	0	2	0	0	3
WA	3	0	0	2	1	0	1	0	0
EXT	0	0	0	0	0	0	0	0	0
Total	38	13	2	14	3	8	5	4	3

Of the three wetland categories, Human-made wetlands are the least often recorded, accounting for just 3.3% of the representation of all wetland types. The most numerous is type C1—Water storage areas (n=38, 42%), followed by C4—Salt exploitation (n=14) and C3—Aquaculture ponds (n=13) (refer to Table A1.4). These three types account for 72% of the representation of human-made wetlands.

Criteria for determining important wetlands

The six Criteria for determining nationally important wetlands are described in Chapter 2.

To be considered nationally important a wetland need only meet one of the criteria, but the majority of the wetlands listed (83.3%) meet more than one of the criteria for inclusion in the Directory (refer to Table A1.5). The only jurisdiction where the majority of wetlands listed meet only one of the criteria is Tasmania, where 31.5% of sites were assessed as meeting multiple criteria.

Table A1.5 Number of Directory sites in each jurisdiction meeting multiple Criteria for inclusion

	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	EXT	Total
Total no. sites	13	178	33	181	69	89	159	120	9	851
No. sites with multiple criteria	7	158	32	162	63	28	139	111	9	709
% sites with multiple criteria	53.8	88.8	97.0	89.5	91.3	31.5	87.4	92.5	100.0	83.3

Table A1.6 details the number of sites meeting the criteria for inclusion by jurisdiction. Most wetlands are included in the Directory under Criterion 1—*“a good example of a wetland type occurring within a biogeographic region in Australia”* (n=702). This criterion is the most recorded or equally most recorded in all jurisdictions except South Australia and Tasmania, where it ranked second.

Table A1.6 Number of Directory sites included under each Criterion by jurisdiction

	1	2	3	4	5	6
ACT	9	3	2	1	3	7
NSW	159	76	106	34	82	42
NT	27	27	27	18	11	18
QLD	180	117	135	48	85	43
SA	54	25	61	5	33	24
TAS	31	6	9	4	74	6
VIC	132	73	122	50	52	38
WA	102	65	82	51	27	94
EXT	8	5	6	6	7	3
Total	702	397	550	217	374	275

The next most common is Criterion 3—*“a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail”* (n=550). This was the most important criterion in South Australia, equal most important in the Northern Territory, and ranked second in New South Wales, Queensland and Victoria.

By far the most common reason for inclusion in Tasmania was Criterion 5—*“wetland supports native plant or animal taxa or communities which are considered endangered or vulnerable at the national level”* (n=74).

The least common reason for inclusion overall is Criterion 4—*“The wetland supports 1% or more of the national populations of any native plant or animal taxa”* (n=217), which is among the most difficult to accurately apply as it is heavily data dependent and assumes a high level of confidence in the estimation of population numbers.



Appendix 2. The Interim Biogeographic Regionalisation for Australia

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Introduction

AS PART OF AN ONGOING PROCESS, ENVIRONMENT AUSTRALIA HAS WORKED WITH THE STATES AND TERRITORIES since 1994 in the cooperative development of the Interim Biogeographic Regionalisation for Australia (IBRA). IBRA is a nationwide framework employed by Australia's nature conservation agencies to define the major ecosystems in continental Australia.

The term "biogeographic region" is used to denote landscapes containing ecosystems that have a high level of similarity. Biogeographic regions are defined according to specified environmental and biological attributes, including combinations of terrain, climate, geology, soil, vegetation and information on flora and fauna. Based as they are on environmental and biological attributes, they are not confined by political boundaries and often extend across State and Territory borders. As implied by the use of the word "interim" in its title, the nature of IBRA is such that it will continue to be refined and improved as additional information on these attributes becomes available.

IBRA version 4.0 (Thackway and Cresswell 1995) divides Australia into 80 distinct biogeographic regions (see Figure 12) which can be further divided into smaller sub-regions, based strongly on geomorphology, but also using vegetation and other data. As such it can provide a regional planning framework within which inventory requirements can be systematically prioritised.

One of the difficulties faced in applying the criteria for determining "important" wetlands in the first edition of the Directory was in assessing the representativeness or uniqueness of sites. In the first edition, this required the comparison of a site relative to those of similar wetland types across Australia.

The ANZECC Wetlands Network agreed in August 1994 that a biogeographic approach would greatly assist in making such assessments less subjective and more meaningful. Indeed, this was the approach adopted by the Queensland Department of Environment and Heritage in preparing the first edition. While various systems of biogeographic regions have been developed, the Network agreed that IBRA was the preferred model as it had the widest acceptance nationally.

Accordingly, the criteria for determining nationally important wetlands were amended to allow a site to be selected as important on the basis of it being "a good example of a wetland type occurring within a biogeographic region in Australia."

Of the 80 bioregions identified by IBRA 4.0, 29 cross jurisdictional boundaries, and a total of 25 bioregions within this category contain wetlands listed in the Directory. The application of the above criterion during the assessment process has enabled neighbouring State and Territory agencies to consult in order to ensure adequate consideration is given to wetlands occurring in shared bioregions. A summary of the environmental characteristics for each of the 80 IBRA regions is given in Thackway and Cresswell (1995) and is also available online at http://www.environment.gov.au/bg/nrs/ibraimcr/ibra_95/index2.htm

During the course of compiling information for this edition of the Directory agreement was reached on a revised version of IBRA. IBRA version 5.1 (Environment Australia 2000) defines 85 bioregions, adding another 5 to the total, and more accurately defines the boundaries of the remaining bioregions. Further information on IBRA 5.1 can also be found at the Internet address above.

All wetlands in the Directory except those in the External Territories have been described according to IBRA 4.0, and subsequent analyses included in this publication used these data. This description remains valid even though a revised version has been introduced. It is anticipated that wetland information will be updated where required using the revised IBRA boundaries.

IBRA summary

Table A2.1 lists all bioregions defined in IBRA 4.0 and their codes, which have been used to identify areas in Figure 12. It also gives the number and area of nationally important wetlands occurring in each bioregion at the time of publication.

In total, 71 out of the 80 bioregions are represented in this Directory (refer to Table A2.1). Seven bioregions contain only one important wetland, while the highest number of nationally important wetlands identified are found in the Mulga Lands (n=57), Murray-Darling Depression (n=48) and Riverina (n=46) bioregions.

Table A2.1 Number and area of Directory sites by IBRA region

IBRA Region	IBRA code	Area of bioregion (km ²)	No. of wetlands	Area of wetlands (ha)
Australian Alps	AA	11,718	16	1,012
Avon Wheatbelt	AW	94,148	5	7,274
Ben Lomond	BEN	8,645	15	281
Brigalow Belt North	BBN	112,780	10	475,697
Brigalow Belt South	BBS	279,496	14	247,754
Broken Hill Complex	BHC	57,055	0	0
Burt Plain	BRT	71,809	0	0
Cape York Peninsula	CYP	115,477	23	2,429,936
Carnarvon	CAR	91,960	8	537,801
Central Arnhem	CA	36,898	0	0
Central Highlands	CH	11,032	12	2,420
Central Kimberley	CK	76,907	3	121
Central Mackay Coast	CMC	14,343	14	703,220
Central Ranges	CR	97,061	1	1
Channel Country	CHC	305,543	25	3,057,435
Cobar Peneplain	CP	73,501	0	0
Coolgardie	COO	125,398	1	550
D'Entrecasteaux	DE	4,203	3	61
Daly Basin	DAB	20,921	1	1,650
Dampierland	DL	89,595	8	168,252
Darling Riverine Plains	DRP	105,511	8	424,566
Desert Uplands	DEU	68,816	5	50,560
Einasleigh Uplands	EIU	128,075	13	132,170
Esperance Plains	ESP	35,370	8	19,960
Eyre and Yorke Blocks	EYB	60,661	16	38,238
Finke	FIN	75,157	1	30,000
Flinders and Olary Ranges	FOR	77,490	1	—
Freycinet	FRE	6,414	8	7,650
Furneaux	FUR	2,372	14	3,729
Gascoyne	GAS	181,273	4	153,627
Gawler	GAW	60,308	0	0
Geraldton Sandplains	GS	38,272	3	4,154
Gibson Desert	GD	155,530	2	501
Great Sandy Desert	GSD	394,599	5	216,306
Great Victoria Desert	GVD	423,751	1	71,000
Gulf Coastal	GUC	27,807	3	303,890

IBRA Region	IBRA code	Area of bioregion (km ²)	No. of wetlands	Area of wetlands (ha)
Gulf Fall and Uplands	GFU	118,975	2	1,233
Gulf Plains	GUP	211,584	15	2,221,612
Hampton	HAM	12,235	0	0
Jarrah Forest	JF	46,078	7	27,068
Little Sandy Desert	LSD	109,613	2	154,202
Lofty Block	LB	23,752	18	50,750
MacDonnell Ranges	MAC	36,986	1	10
Mallee	MAL	79,874	3	13,348
Mitchell Grass Downs	MGD	319,788	8	402,885
Mount Isa Inlier	MII	66,586	4	329,204
Mulga Lands	ML	257,850	57	897,435
Murchison	MUR	278,360	6	304,630
Murray-Darling Depression	MDD	197,480	48	657,620
NSW North Coast	NNC	60,794	23	232,209
NSW South Western Slopes	NSS	84,278	7	41,400
Nandewar	NAN	27,322	0	0
Naracoorte Coastal Plain	NCP	28,905	20	301,193
New England Tableland	NET	29,347	3	588
Northern Kimberley	NK	87,017	4	589,540
Nullarbor	NUL	194,946	0	0
Ord-Victoria Plains	OVP	125,177	2	25,000
Pilbara	PIL	179,287	6	126,912
Pine-Creek Arnhem	PCA	51,576	2	1,376,090
Riverina	RIV	90,534	46	204,031
Simpson-Strzelecki Dunefields	SSD	277,876	4	1,803,816
South East Coastal Plain	SCP	18,813	23	154,284
South East Corner	SEC	27,477	29	82,364
South Eastern Highlands	SEH	82,576	31	34,874
South Eastern Queensland	SEQ	68,726	13	667,130
Stony Plains	STP	181,591	2	19,000
Sturt Plateau	STU	99,719	0	0
Swan Coastal Plain	SWA	15,181	29	30,470
Sydney Basin	SB	36,655	43	93,745
Tanami	TAN	316,656	2	39,500
Tasmanian Midlands	TM	7,762	20	2,128
Top End Coast	TEC	68,681	12	978,900
Victoria Bonaparte	VB	72,970	6	1,086,200

IBRA Region	IBRA code	Area of bioregion (km ²)	No. of wetlands	Area of wetlands (ha)
Victorian Midlands	VM	37,025	8	8,631
Victorian Volcanic Plain	VVP	22,139	26	47,107
Warren	WAR	10,420	8	11,015
West and South West	WSW	18,269	7	66
Wet Tropics	WT	18,497	29	163,079
Woolnorth	WOO	9,645	10	35,179
Yalgoo	YAL	36,115	2	585
Great Barrier Reef			3	34,251,468
Total	80	7,685,033	842*	56,556,317

* the nine External Territories wetlands are not included in this table.

Note: area figures for wetlands are approximate only and are not available for all wetlands.

References

Thackway, R and Cresswell, I.D. (Eds) 1995. *An Interim Biogeographic Regionalisation for Australia: A framework for setting priorities in the national reserves system cooperative program, Version 4.0*. Australian Nature Conservation Agency, Canberra.

Environment Australia (2000). *Revision of the Interim Biogeographic Regionalisation of Australia (IBRA) and Development of Version 5.1—Summary Report*. Environment Australia, Canberra.

Table A2.2 Interim Biogeographic Regionalisation for Australia, version 4.0

IBRA code	IBRA Region	IBRA code	IBRA Region
AA	Australian Alps	LSD	Little Sandy Desert
AW	Avon Wheatbelt	LB	Lofty Block
BEN	Ben Lomond	MAC	MacDonnell Ranges
BBN	Brigalow Belt North	MAL	Mallee
BBS	Brigalow Belt South	MGD	Mitchell Grass Downs
BHC	Broken Hill Complex	MII	Mount Isa Inlier
BRT	Burt Plain	ML	Mulga Lands
CYP	Cape York Peninsula	MUR	Murchison
CAR	Carnarvon	MDD	Murray-Darling Depression
CA	Central Arnhem	NNC	NSW North Coast
CH	Central Highlands	NSS	NSW South Western Slopes
CK	Central Kimberley	NAN	Nandewar
CMC	Central Mackay Coast	NCP	Naracoorte Coastal Plain
CR	Central Ranges	NET	New England Tableland
CHC	Channel Country	NK	Northern Kimberley
CP	Cobar Peneplain	NUL	Nullarbor
COO	Coolgardie	OVP	Ord-Victoria Plains
DE	D'Entrecasteaux	PIL	Pilbara
DAB	Daly Basin	PCA	Pine-Creek Arnhem
DL	Dampierland	RIV	Riverina
DRP	Darling Riverine Plains	SSD	Simpson-Strzelecki Dunefields
DEU	Desert Uplands	SCP	South East Coastal Plain
EIU	Einasleigh Uplands	SEC	South East Corner
ESP	Esperance Plains	SEH	South Eastern Highlands
EYB	Eyre and Yorke Blocks	SEQ	South Eastern Queensland
FIN	Finke	STP	Stony Plains
FOR	Flinders and Olary Ranges	STU	Sturt Plateau
FRE	Freycinet	SWA	Swan Coastal Plain
FUR	Furneaux	SB	Sydney Basin
GAS	Gascoyne	TAN	Tanami
GAW	Gawler	TM	Tasmanian Midlands
GS	Geraldton Sandplains	TEC	Top End Coast
GD	Gibson Desert	VB	Victoria Bonaparte
GSD	Great Sandy Desert	VM	Victorian Midlands
GVD	Great Victoria Desert	VVP	Victorian Volcanic Plain
GUC	Gulf Coastal	WAR	Warren
GFU	Gulf Fall and Uplands	WSW	West and South West
GUP	Gulf Plains	WT	Wet Tropics
HAM	Hampton	WOO	Woolnorth
JF	Jarrah Forest	YAL	Yalgoo



Appendix 3. Summary analysis of Directory sites by Drainage Basin

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ANALYSIS OF THE DISTRIBUTION AND REPRESENTATION OF NATIONALLY IMPORTANT WETLANDS IN DRAINAGE BASINS WAS UNDERTAKEN VIA GIS, using the Australian Water Resources Commission Drainage Division and Basins coverage. The coverage defines 245 drainage basins in continental Australia. The coverage of nationally important wetlands produced to generate the State and Territory maps for this publication uses centroids to identify sites, hence these are represented as points not areas, and wetlands were assigned to only one drainage basin. As a result there are some limitations with this analysis.

Some coastal sites that had centroids offshore were assigned to drainage basins manually. In some instances this involved a subjective assessment and was somewhat arbitrary; for example Moreton Bay receives input from five drainage basins, only one of which (Brisbane River) was included.

The coverage of Drainage Divisions and Basins is shown at Figure 13. Table A3.4 can be used to refer to Drainage Division and Drainage Basin numbers given on the map.

Of the 245 drainage basins, 189 contain nationally important wetlands (refer to Table A3.1). Sixteen "offshore" wetlands are not included in this analysis: the nine External Territories sites; three Great Barrier Reef sites in Queensland; Five Islands Nature Reserve, Solitary Islands Marine Park and Cook Island Nature Reserve in New South Wales; and Mud Islands in Victoria, hence the total of 835 wetlands.

Table A3.1 Number and area of sites in Drainage Basins containing nationally important wetlands

Drainage Basin	Drainage Basin No.	Drainage Division No. and Name	No. sites	Area (ha)
Adelaide River	17	VIII Timor Sea	2	239,800
Albany Coast	2	VI South-west Coast	6	26,108
Archer River	22	IX Gulf of Carpentaria	1	149,761
Arthur River	12	III Tasmania	1	5
Ashburton River	6	VII Indian Ocean	3	607
Avoca River	8	IV Murray-Darling	10	25,752
Avon River	15	VI South-west Coast	5	14,124
Baffle Creek	34	I North-east Coast	2	46,157
Barkly	9	XII Western Plateau	5	328,000
Barron River	10	I North-east Coast	1	43
Barwon River	33	II South-east Coast	3	7,450
Bega River	19	II South-east Coast	5	1,583
Bellinger River	5	II South-east Coast	1	367
Benanee	13	IV Murray-Darling	2	7,102
Blackwood River	9	VI South-west Coast	6	8,438
Blyth River	24	VIII Timor Sea	1	35,500
Border Rivers	16	IV Murray-Darling	1	460
Brisbane River	43	I North-east Coast	2	304,842
Broken River	4	IV Murray-Darling	4	66,904
Broughton River	7	V South Australian Gulf	3	3,019
Brunswick River	2	II South-east Coast	2	1,327
Bulloo River	1	XI Bulloo-Bancannia	7	279,587
Bunyip River	28	II South-east Coast	2	52,540
Burdekin River	20	I North-east Coast	12	171,582
Burrum River	37	I North-east Coast	1	15,128
Busselton Coast	10	VI South-west Coast	2	1,025
Calliope River	32	I North-east Coast	1	31,264
Cape Leveque Coast	1	VIII Timor Sea	4	98,042
Clarence River	4	II South-east Coast	8	28,816
Clyde River-Jervis Bay	16	II South-east Coast	13	53,789
Coleman River	20	IX Gulf of Carpentaria	2	182,444
Collie River	12	VI South-west Coast	1	572
Condamine-Culgoa Rivers	22	IV Murray-Darling	20	288,002
Cooper Creek	3	X Lake Eyre	11	2,418,502
Curtis Island	31	I North-east Coast	2	30,442
Daintree River	8	I North-east Coast	3	6,122
Daly River	14	VIII Timor Sea	3	161,100
Darling River	25	IV Murray-Darling	3	314,000
De Grey River	10	VII Indian Ocean	1	13,600
Derwent River	4	III Tasmania	13	4,016
Diamantina River	2	X Lake Eyre	6	79,224
Don River	21	I North-east Coast	2	16,243
Drysdale River	7	VIII Timor Sea	1	5,100
Ducie River	26	IX Gulf of Carpentaria	3	197,619
East Alligator River	21	VIII Timor Sea	2	165,500
East Coast	2	III Tasmania	12	7,940
East Gippsland	21	II South-east Coast	7	18,962
Esperance Coast	1	VI South-west Coast	5	15,860

Drainage Basin	Drainage Basin No.	Drainage Division No. and Name	No. sites	Area (ha)
Eyre Peninsula	12	V South Australian Gulf	4	22,440
Finke River	5	X Lake Eyre	2	19,010
Finniss River	15	VIII Timor Sea	3	131,700
Fitzroy River (Qld)	30	I North-east Coast	8	169,295
Fitzroy River (WA)	2	VIII Timor Sea	3	30,230
Fleurieu Peninsula	1	V South Australian Gulf	2	56
Flinders River	15	IX Gulf of Carpentaria	2	349
Flinders-Cape Barren Islands	1	III Tasmania	14	3,729
Fortescue River	8	VII Indian Ocean	3	100,230
Forth River	15	III Tasmania	1	100
Fraser Island	39	I North-east Coast	1	163,294
Gairdner	1	XII Western Plateau	6	10,845
Gascoyne River	4	VII Indian Ocean	1	2,500
Gawler River	5	V South Australian Gulf	1	434
Georgina River	1	X Lake Eyre	9	414,785
Gilbert River	17	IX Gulf of Carpentaria	3	251,832
Glenelg River	38	II South-east Coast	6	6,863
Gordon River	8	III Tasmania	2	26
Goulburn River	5	IV Murray-Darling	6	18,902
Goyder River	25	VIII Timor Sea	1	71,400
Greenough River	1	VII Indian Ocean	1	3,000
Gwydir River	18	IV Murray-Darling	1	102,120
Harvey River	13	VI South-west Coast	3	20,000
Hastings River	7	II South-east Coast	2	18,642
Haughton River	19	I North-east Coast	2	181,738
Hawkesbury River	12	II South-east Coast	10	5,222
Herbert River	16	I North-east Coast	6	72,086
Hinchinbrook Island	15	I North-east Coast	1	1,129
Holroyd River	21	IX Gulf of Carpentaria	1	1,114,324
Hopkins River	36	II South-east Coast	9	3,491
Hunter River	10	II South-east Coast	4	4,971
Huon River	6	III Tasmania	2	—
Isdell River	4	VIII Timor Sea	1	566,000
Jacky Jacky Creek	1	I North-east Coast	4	89,457
Jardine River	27	IX Gulf of Carpentaria	1	17,239
Jeannie River	6	I North-east Coast	2	49,514
Johnstone River	12	I North-east Coast	6	10,416
Kangaroo Island	13	V South Australian Gulf	13	50,304
Karuah River	9	II South-east Coast	3	64,820
Keep River	10	VIII Timor Sea	2	103,700
Kent River	4	VI South-west Coast	2	1,100
Kiewa River	2	IV Murray-Darling	1	60
King Edward River	6	VIII Timor Sea	1	4,140
King Island	13	III Tasmania	7	7,076
King-Henty Rivers	9	III Tasmania	3	25
Kingston Coast	5	III Tasmania	2	51
Lachlan River	12	IV Murray-Darling	8	52,120
Lake Bancannia	2	XI Bulloo-Bancannia	2	5,816
Lake Corangamite	34	II South-east Coast	16	35,824

Drainage Basin	Drainage Basin No.	Drainage Division No. and Name	No. sites	Area (ha)
Lake Frome	4	X Lake Eyre	4	1,798,000
Lake George	11	IV Murray-Darling	1	15,000
Leichhardt River	13	IX Gulf of Carpentaria	3	549,030
Lennard River	3	VIII Timor Sea	3	101
Lockhart River	3	I North-east Coast	2	60,516
Loddon River	7	IV Murray-Darling	18	28,282
Logan-Albert Rivers	45	I North-east Coast	1	329
Lower Murray River	26	IV Murray-Darling	10	175,147
Lyndon-Minilya Rivers	5	VII Indian Ocean	6	535,301
Mackay	6	XII Western Plateau	7	197,402
Macleay River	6	II South-east Coast	4	8,497
Macquarie-Bogan Rivers	21	IV Murray-Darling	1	200,000
Macquarie-Tuggerah Lakes	11	II South-east Coast	4	832
Mallee	14	IV Murray-Darling	16	41,320
Mambray Coast	8	V South Australian Gulf	1	—
Manning River	8	II South-east Coast	1	1,500
Maroochy River	41	I North-east Coast	1	9,442
Mary River (Qld)	38	I North-east Coast	1	1,983
Mary River (NT)	18	VIII Timor Sea	1	127,600
McArthur River	7	IX Gulf of Carpentaria	2	119,090
Mersey River	16	III Tasmania	2	2
Millicent Coast	39	II South-east Coast	14	155,262
Mitchell River (Vic)	24	II South-east Coast	6	11,776
Mitchell River (WA)	19	IX Gulf of Carpentaria	3	1,051,194
Moorabool River	32	II South-east Coast	1	5,460
Moore-Hill Rivers	17	VI South-west Coast	5	3,486
Morning Inlet	14	IX Gulf of Carpentaria	1	1,909
Mornington Island	11	IX Gulf of Carpentaria	1	6,388
Moruya River	17	II South-east Coast	1	50
Moyle River	13	VIII Timor Sea	1	48,100
Mulgrave-Russell Rivers	11	I North-east Coast	9	14,051
Murchison River	2	VII Indian Ocean	4	15,575
Murray River (Qld)	14	I North-east Coast	4	80,658
Murray River (WA)	14	VI South-west Coast	4	390
Murray-Riverina	9	IV Murray-Darling	3	44,484
Murrumbidgee River	10	IV Murray-Darling	29	205,789
Myponga River	2	V South Australian Gulf	1	30
Namoi River	19	IV Murray-Darling	1	6,385
Nicholson River	12	IX Gulf of Carpentaria	7	603,345
Noosa River	40	I North-east Coast	4	125,955
Normanby River	5	I North-east Coast	5	518,208
O'Connell River	24	I North-east Coast	2	26,263
Olive-Pascoe Rivers	2	I North-east Coast	2	22,033
Onkaparinga River	3	V South Australian Gulf	1	60
Ord River	9	VIII Timor Sea	3	111,500
Otway Coast	35	II South-east Coast	4	1,382
Ovens River	3	IV Murray-Darling	4	6,842
Paroo River	24	IV Murray-Darling	33	779,561
Pieman River	10	III Tasmania	1	1

Drainage Basin	Drainage Basin No.	Drainage Division No. and Name		No. sites	Area (ha)
Piper-Ringarooma Rivers	19	III	Tasmania	12	256
Plane Creek	26	I	North-east Coast	3	42,447
Port Hedland Coast	9	VII	Indian Ocean	1	13,000
Portland Coast	37	II	South-east Coast	2	379
Proserpine River	22	I	North-east Coast	2	21,444
Roper River	3	IX	Gulf of Carpentaria	1	100
Rosie River	6	IX	Gulf of Carpentaria	2	3,081
Salt Lake	4	XII	Western Plateau	8	514,832
Sandy Desert	5	XII	Western Plateau	7	306,808
Settlement Creek	10	IX	Gulf of Carpentaria	1	82,430
Shannon River	6	VI	South-west Coast	5	17,275
Shoalhaven River	15	II	South-east Coast	4	5,170
Shoalwater Creek	28	I	North-east Coast	3	788,714
Smithton-Burnie Coast	14	III	Tasmania	3	28,103
Snowy River	22	II	South-east Coast	14	54,254
South Alligator River	20	VIII	Timor Sea	1	1,375,940
South Gippsland	27	II	South-east Coast	7	68,653
South-west Coast	7	III	Tasmania	1	10
Spencer Gulf	11	V	South Australian Gulf	1	1,500
Staaten River	18	IX	Gulf of Carpentaria	1	6,801
Swan Coast	16	VI	South-west Coast	17	6,094
Sydney Coast-Georges River	13	II	South-east Coast	8	25,404
Tamar River	18	III	Tasmania	14	164
Tambo River	23	II	South-east Coast	6	2,049
Thomson River	25	II	South-east Coast	4	18,045
Torrens River	4	V	South Australian Gulf	1	—
Towamba River	20	II	South-east Coast	3	1,500
Towns River	4	IX	Gulf of Carpentaria	1	184,800
Tully River	13	I	North-east Coast	1	232
Tuross River	18	II	South-east Coast	3	1,265
Tweed River	1	II	South-east Coast	2	267
Upper Murray River	1	IV	Murray-Darling	5	26,885
Victoria River	11	VIII	Timor Sea	1	871,000
Warrego River	23	IV	Murray-Darling	6	1,146
Water Park Creek	29	I	North-east Coast	5	45,707
Watson River	23	IX	Gulf of Carpentaria	1	29,911
Werribee River	31	II	South-east Coast	2	6,390
Wimmera-Avon Rivers	15	IV	Murray-Darling	16	89,322
Wiso	8	XII	Western Plateau	2	5,890
Wollongong Coast	14	II	South-east Coast	4	3,451
Wooramel River	3	VII	Indian Ocean	1	—
Yarra River	29	II	South-east Coast	1	1,065
Yarra Yarra Lakes	18	VI	South-west Coast	2	585
Total				835	22,294,655

Note: area figures are approximate only and are not available for all wetlands.

The 22 drainage basins with ten or more nationally important wetlands hold 337 or 40.3% of the 835 continental wetlands, with an approximate area of 4.6 million hectares (refer to Table 1.4). The number of drainage basins containing listed wetlands, but with less than ten, is shown below in Table A3.2.

Table A3.2 Number of Drainage Basins with less than ten nationally important wetlands

	No. of Drainage Basins	No. of wetlands	Area of wetlands (ha)
9 wetlands	3	27	432,327
8 wetlands	5	40	790,467
7 wetlands	7	49	1,481,833
6 wetlands	12	72	783,154
5 wetlands	9	45	971,128
4 wetlands	17	68	2,346,611
3 wetlands	24	72	3,907,092
2 wetlands	35	70	1,693,364
1 wetland	55	55	5,288,566
Total	167	498	17,694,542

Note: area figures are approximate only and are not available for all wetlands.

The fifty-six drainage basins listed in Table A3.3 do not currently contain wetlands recognised as nationally important, reflecting in most instances gaps in primary information.

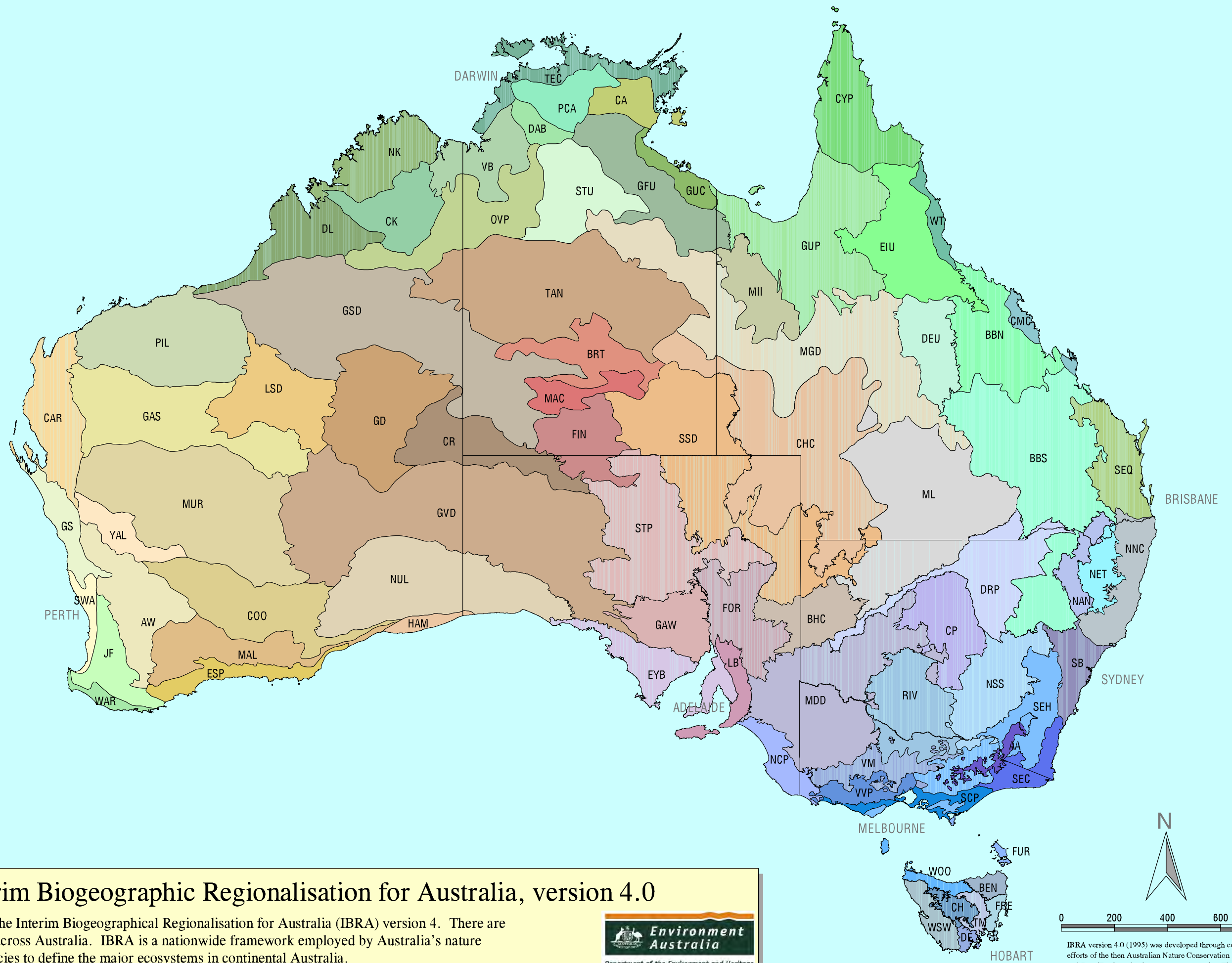
Table A3.3 Drainage Basins with no nationally important wetlands

Drainage Basin	Drainage Basin No.	Drainage Division No. and Name	
Bathurst and Melville Islands	16	VIII	Timor Sea
Black River	17	I	North-east Coast
Boyne River	33	I	North-east Coast
Buckingham River	26	VIII	Timor Sea
Burnett River	36	I	North-east Coast
Burt	7	XII	Western Plateau
Calvert River	9	IX	Gulf of Carpentaria
Campaspe River	6	IV	Murray-Darling
Castlereagh River	20	IV	Murray-Darling
Coal River	3	III	Tasmania
Denmark River	3	VI	South-west Coast
Donnelly River	8	VI	South-west Coast
Embley River	24	IX	Gulf of Carpentaria
Endeavour River	7	I	North-east Coast
Fitzmaurice River	12	VIII	Timor Sea
Frankland River	5	VI	South-west Coast
Goomadeer River	22	VIII	Timor Sea
Groote Eylandt	29	IX	Gulf of Carpentaria
Hay River	7	X	Lake Eyre
Kolan River	35	I	North-east Coast

Drainage Basin	Drainage Basin No.	Drainage Division No. and Name	
Koolatong River	1	IX	Gulf of Carpentaria
Lake Torrens	10	V	South Australian Gulf
Latrobe River	26	II	South-east Coast
Limmen Bight River	5	IX	Gulf of Carpentaria
Liverpool River	23	VIII	Timor Sea
Maribyrnong River	30	II	South-east Coast
Moonie River	17	IV	Murray-Darling
Mossman River	9	I	North-east Coast
Ninghan	19	VI	South-west Coast
Norman River	16	IX	Gulf of Carpentaria
Nullarbor	2	XII	Western Plateau
Onslow Coast	7	VII	Indian Ocean
Pentecost River	8	VIII	Timor Sea
Pine River	42	I	North-east Coast
Pioneer River	25	I	North-east Coast
Preston River	11	VI	South-west Coast
Prince Regent River	5	VIII	Timor Sea
Richmond River	3	II	South-east Coast
Robinson River	8	IX	Gulf of Carpentaria
Ross River	18	I	North-east Coast
Rubicon River	17	III	Tasmania
Sandy Cape Coast	11	III	Tasmania
South Coast	46	I	North-east Coast
Stewart River	4	I	North-east Coast
Stradbroke Island	44	I	North-east Coast
Styx River	27	I	North-east Coast
Todd River	6	X	Lake Eyre
Torres Strait Islands	28	IX	Gulf of Carpentaria
Wakefield River	6	V	South Australian Gulf
Walker River	2	IX	Gulf of Carpentaria
Warburton	3	XII	Western Plateau
Warren River	7	VI	South-west Coast
Wenlock River	25	IX	Gulf of Carpentaria
Whitsunday Island	23	I	North-east Coast
Wildman River	19	VIII	Timor Sea
Willochra Creek	9	V	South Australian Gulf

Table A3.4 Australia's Drainage Divisions and Basins

I	NORTH-EAST COAST	8	Manning River	19	Piper-Ringarooma Rivers	6	Shannon River	IX	GULF OF CARPENTARIA				
1	Jacky Jacky Creek	9	Karuah River	IV	MURRAY-DARLING	7	Warren River	1	Koolatong River				
2	Olive-Pascoe Rivers	10	Hunter River			8	Donnelly River	2	Walker River				
3	Lockhart River	11	Macquarie-Tuggerah Lakes			9	Blackwood River	3	Roper River				
4	Stewart River	12	Hawkesbury River			10	Busselton Coast	4	Towns River				
5	Normanby River	13	Sydney Coast-Georges River			11	Preston River	5	Limmen Bight River				
6	Jeannie River	14	Wollongong Coast			12	Collie River	6	Rosie River				
7	Endeavour River	15	Shoalhaven River			13	Harvey River	7	McArthur River				
8	Daintree River	16	Clyde River-Jervis Bay			14	Murray River (WA)	8	Robinson River				
9	Mossman River	17	Moruya River			15	Avon River	9	Calvert River				
10	Barron River	18	Tuross River			16	Swan Coast	10	Settlement Creek				
11	Mulgrave-Russell Rivers	19	Bega River			17	Moore-Hill Rivers	11	Mornington Island				
12	Johnstone River	20	Towamba River			18	Yarra Yarra Lakes	12	Nicholson River				
13	Tully River	21	East Gippsland			19	Ninghan	13	Leichhardt River				
14	Murray River (Qld)	22	Snowy River	VII	INDIAN OCEAN	1	Greenough River	14	Morning Inlet				
15	Hinchinbrook Island	23	Tambo River			2	Murchison River	15	Flinders River				
16	Herbert River	24	Mitchell River (Vic)			3	Wooramel River	16	Norman River				
17	Black River	25	Thomson River			4	Gascoyne River	17	Gilbert River				
18	Ross River	26	Latrobe River			5	Lyndon-Minilya Rivers	18	Staaten River				
19	Haughton River	27	South Gippsland			6	Ashburton River	19	Mitchell River (WA)				
20	Burdekin River	28	Bunyip River			7	Onslow Coast	20	Coleman River				
21	Don River	29	Yarra River			8	Fortescue River	21	Holroyd River				
22	Proserpine River	30	Maribyrnong River			9	Port Hedland Coast	22	Archer River				
23	Whitsunday Island	31	Werribee River			10	De Grey River	23	Watson River				
24	O'Connell River	32	Moorabool River			VIII	TIMOR SEA	24	Embley River				
25	Pioneer River	33	Barwon River					25	Wenlock River				
26	Plane Creek	34	Lake Corangamite					26	Ducie River				
27	Styx River	35	Otway Coast	27	Jardine River								
28	Shoalwater Creek	36	Hopkins River	28	Torres Strait Islands								
29	Water Park Creek	37	Portland Coast	29	Groote Eylandt								
30	Fitzroy River (Qld)	38	Glenelg River	X	LAKE EYRE			1	Georgina River				
31	Curtis Island	39	Millicent Coast					2	Diamantina River				
32	Calliope River	III	TASMANIA					3	Cooper Creek				
33	Boyne River							1	Flinders-Cape Barren Islands	4	Lake Frome		
34	Baffle Creek							2	East Coast	5	Finke River		
35	Kolan River							3	Coal River	6	Todd River		
36	Burnett River							4	Derwent River	7	Hay River		
37	Burrum River					5	Kingston Coast	XI	BULLOO-BANCANNIA				
38	Mary River (Qld)					6	Huon River			1	Bulloo River		
39	Fraser Island					7	South-west Coast			2	Lake Bancannia		
40	Noosa River					8	Gordon River			XII	WESTERN PLATEAU		
41	Maroochy River					9	King-Henty Rivers					1	Gairdner
42	Pine River					10	Pieman River					2	Nullarbor
43	Brisbane River			11	Sandy Cape Coast	3	Warburton						
44	Stradbroke Island			12	Arthur River	4	Salt Lake						
45	Logan-Albert Rivers	13	King Island	5	Sandy Desert								
46	South Coast	14	Smithton-Burnie Coast	6	Mackay								
II	SOUTH-EAST COAST	15	Forth River	VI	SOUTH-WEST COAST	7	Burt						
		16	Mersey River			8	Wiso						
		17	Rubicon River			9	Barkly						
		18	Tamar River			5	Frankland River						
		1	Tweed River			2	Albany Coast						
		2	Brunswick River			3	Denmark River						
		3	Richmond River			4	Kent River						
		4	Clarence River			5	Frankland River						
		5	Bellinger River			1	Esperance Coast						
6	Macleay River	2	Albany Coast										
7	Hastings River	3	Denmark River										

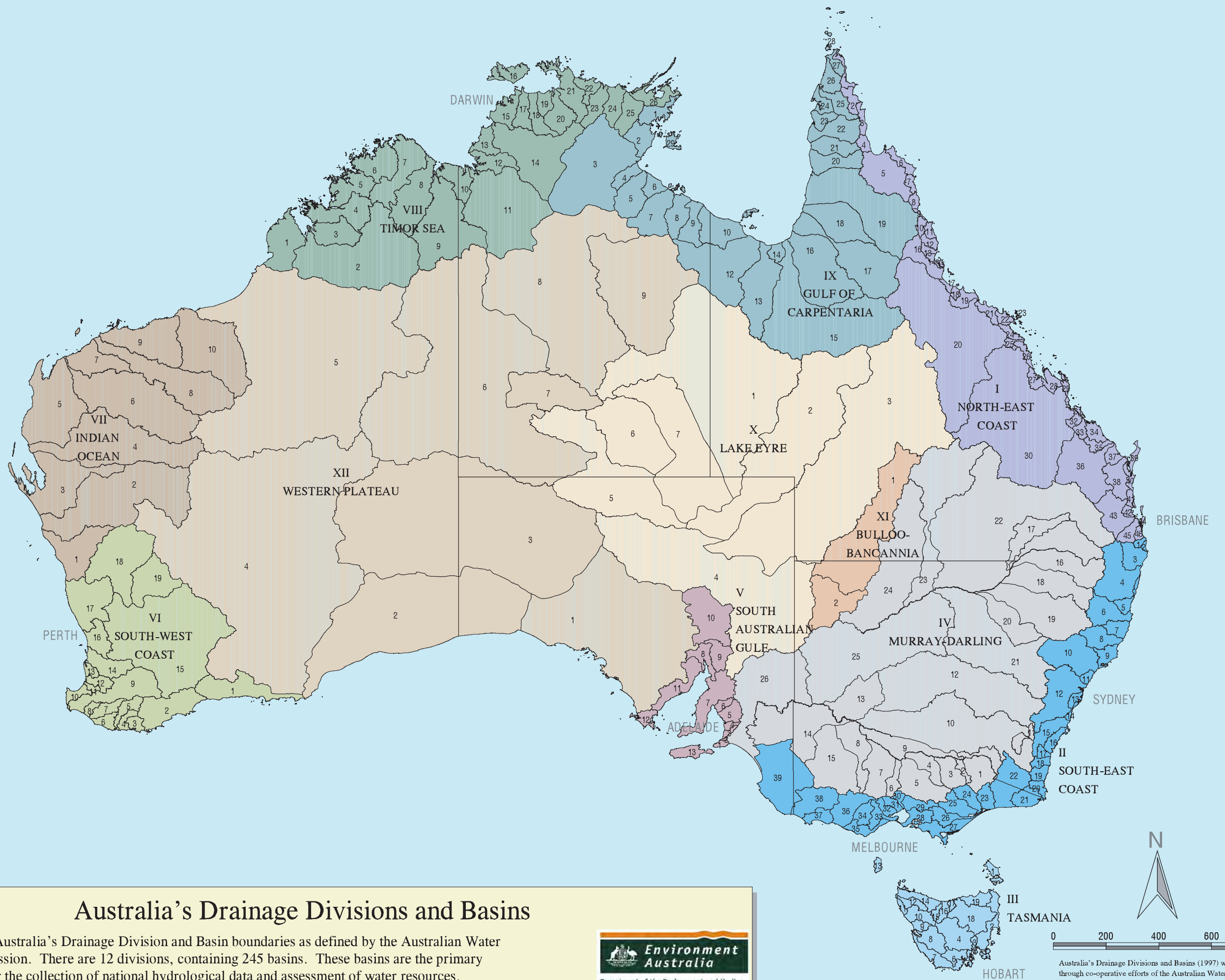


Interim Biogeographic Regionalisation for Australia, version 4.0

This map depicts the Interim Biogeographical Regionalisation for Australia (IBRA) version 4. There are 80 IBRA regions across Australia. IBRA is a nationwide framework employed by Australia's nature conservation agencies to define the major ecosystems in continental Australia.



IBRA version 4.0 (1995) was developed through co-operative efforts of the then Australian Nature Conservation Agency (ANCA) and State/Territory land management agencies. The data used are assumed to be correct as received by the custodian.





Appendix 4. Ramsar Classification System for Wetland Type

The Ramsar Convention definition of “wetland” and classification system for wetland type

Definition

Under the Convention on Wetlands (Ramsar, Iran, 1971) “wetlands” are defined by Articles 1.1 and 2.1 as shown below:

Article 1.1:

“For the purpose of this Convention wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres.”

Article 2.1 provides that wetlands:

“may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands”.

Ramsar Classification System for Wetland Type

The codes are based upon the Ramsar Classification System for Wetland Type as approved by Recommendation 4.7 and amended by Resolution VI.5 of the Conference of the Contracting Parties. The categories listed herein are intended to provide only a very broad framework to aid rapid identification of the main wetland habitats represented at each site.

Marine/Coastal Wetlands

- A Permanent shallow marine waters in most cases less than six metres deep at low tide; includes sea bays and straits.
- B Marine subtidal aquatic beds; includes kelp beds, sea-grass beds, tropical marine meadows.
- C Coral reefs.
- D Rocky marine shores; includes rocky offshore islands, sea cliffs.
- E Sand, shingle or pebble shores; includes sand bars, spits and sandy islets; includes dune systems and humid dune slacks.
- F Estuarine waters; permanent water of estuaries and estuarine systems of deltas.
- G Intertidal mud, sand or salt flats.
- H Intertidal marshes; includes salt marshes, salt meadows, saltings, raised salt marshes; includes tidal brackish and freshwater marshes.
- I Intertidal forested wetlands; includes mangrove swamps, nipah swamps and tidal freshwater swamp forests.
- J Coastal brackish/saline lagoons; brackish to saline lagoons with at least one relatively narrow connection to the sea.
- K Coastal freshwater lagoons; includes freshwater delta lagoons.
- Zk(a) Karst and other subterranean hydrological systems, marine/coastal

Inland Wetlands

- L Permanent inland deltas.
- M Permanent rivers/streams/creeks; includes waterfalls.
- N Seasonal/intermittent/irregular rivers/streams/creeks.
- O Permanent freshwater lakes (over 8 ha); includes large oxbow lakes.
- P Seasonal/intermittent freshwater lakes (over 8 ha); includes floodplain lakes.
- Q Permanent saline/brackish/alkaline lakes.
- R Seasonal/intermittent saline/brackish/alkaline lakes and flats.
- Sp Permanent saline/brackish/alkaline marshes/pools.
- Ss Seasonal/intermittent saline/brackish/alkaline marshes/pools.
- Tp Permanent freshwater marshes/pools; ponds (below 8 ha), marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.
- Ts Seasonal/intermittent freshwater marshes/pools on inorganic soils; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.
- U Non-forested peatlands; includes shrub or open bogs, swamps, fens.
- Va Alpine wetlands; includes alpine meadows, temporary waters from snowmelt.
- Vt Tundra wetlands; includes tundra pools, temporary waters from snowmelt.

W	Shrub-dominated wetlands; shrub swamps, shrub-dominated freshwater marshes, shrub carr, alder thicket on inorganic soils.
Xf	Freshwater, tree-dominated wetlands; includes freshwater swamp forests, seasonally flooded forests, wooded swamps on inorganic soils.
Xp	Forested peatlands; peatswamp forests.
Y	Freshwater springs; oases.
Zg	Geothermal wetlands
Zk(b)	Karst and other subterranean hydrological systems, inland

Note : "floodplain" is a broad term used to refer to one or more wetland types, which may include examples from the R, Ss, Ts, W, Xf, Xp, or other wetland types. Some examples of floodplain wetlands are seasonally inundated grassland (including natural wet meadows), shrublands, woodlands and forests. Floodplain wetlands are not listed as a specific wetland type herein.

Human-made wetlands

1	Aquaculture (e.g., fish/shrimp) ponds
2	Ponds; includes farm ponds, stock ponds, small tanks; (generally below 8 ha).
3	Irrigated land; includes irrigation channels and rice fields.
4	Seasonally flooded agricultural land (including intensively managed or grazed wet meadow or pasture).
5	Salt exploitation sites; salt pans, salines, etc.
6	Water storage areas; reservoirs/barrages/dams/impoundments (generally over 8 ha).
7	Excavations; gravel/brick/clay pits; borrow pits, mining pools.
8	Wastewater treatment areas; sewage farms, settling ponds, oxidation basins, etc.
9	Canals and drainage channels, ditches.
Zk(c)	Karst and other subterranean hydrological systems, human-made

Reprinted from Appendix A of the Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance (refer to <http://ramsar.org>)