POORLY CONSERVED AND POTENTIALLY THREATENED VEGETATION TYPES IN THE WESTERN AUSTRALIAN WHEATBELT. I. ASSOCIATIONS

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SUMMARY

This report details the first set of results of a project designed to contribute to the development of an inventory of Threatened Ecological Communities in Western Australia. The project builds on earlier work developing a digital vegetation map database for the State and assessing the levels of representation of each vegetation type in the conservation reserve system. This project focuses on that part of the South West Agricultural Region that is commonly known as the wheatbelt, where the native vegetation has been extensively cleared for agriculture and where, as a consequence of the clearing, there are problems of rising groundwater and the related problem of salinisation. The study area is the 12 major Soil Landscape Zones within the South West Agricultural Region where salinity is considered to be a major problem. The project draws on data sets of native vegetation extent, the conservation estate and soils with evidence of salinisation to identify vegetation types that are poorly represented in the present conservation reserve system, restricted in present extent and at risk from rising groundwater.

Data on some 236 vegetation associations are provided. Of these associations with some expression in the south-west corner of the State, 92 have less than 10% of their original areal distribution remaining, and a further 71 have <30% remaining. One hundred and thirty two vegetation associations have <2,000 ha remaining in the South West Agricultural Region but 38 of these 71 have extensive representation (>50,000 ha) outside the study area. Eighty-two vegetation associations are completely unrepresented in the conservation estate. These associations are not represented in conservation reserves that fit criteria for IUCN Reserve Categories I-IV, or on other categories of CALM-managed land. An additional 15 association are unrepresented in reserves that fall into IUCN Reserve Categories I-IV but are represented to a small degree on other CALM-managed lands. A further 110 vegetation associations have <15% of their original areal extent in reserves that fall into IUCN Reserve Categories I-IV. A total of 44 associations are potentially at risk from rising groundwater: 18 associations have 100% of their present extent on soils at risk from salinity, a further 18 associations have >70% of their present extent on soils at risk, and an additional 9 associations have >50% of their present extent on soils at risk.

The project identifies 5 vegetation associations that should be given priority for further research because they are extensively cleared, associated with saline soils so potentially at risk, and completely unrepresented in the present conservation reserve system. They should be considered for classifying as Threatened Ecological Communities.

INTRODUCTION

In Western Australia, the process of identifying biodiversity entities at the ecosystem scale began in 1994, with a project entitled *Identifying and conserving threatened ecological communities (TECs) in the South West Botanical Province* (English and Blyth 1997, 1999). A major limitation that was encountered during the project was the lack of data of sufficient quality to assess many of the communities possibly threatened against the criteria for defining categories of conservation status. This limitation was particularly acute in the part of the South West Botanical Province commonly known as the wheatbelt. In this region, it is known that there are many special biological values, yet the biota is poorly documented overall. At the same time, there are seriously threatening process in force, including land clearing and fragmentation, and rising groundwater and associated salinisation which are a direct consequence of the clearing of the deep-rooted native vegetation (eg Government of Western Australia 1996). There is an imperative, therefore, to improve substantially the protection and management of the remaining biological values. One means to achieve this is through the threatened ecological communities process.

The recent development of a comprehensive, digital vegetation map database for Western Australia (Hopkins *et al.* 1996) provided an opportunity to address the gaps in knowledge in the wheatbelt and to contribute to the process of identifying threatened ecological communities. This data set is based on the 1:250,000 scale association-level mapping by J.S. Beard for all of the State except the south west corner which was mapped by A.J.M. Hopkins in 1998/99. Mapped vegetation units are a useful surrogate for ecosystems (Hopkins and Morgan 1999).

This project was designed to use the vegetation map database and other relevant digital data in a Geographic Information System (GIS) environment to identify some entities (ecosystems or ecological communities, see Hopkins 2000) that could be surveyed and then considered for listing as threatened ecological communities. These entities are vegetation units that are poorly represented in the present conservation reserve system and at risk.

The study was undertaken in two parts. For the part reported here, vegetation associations as originally mapped at the 1:250,000 scale were used as the basic environmental unit. For the second part of the study which is reported separately, these associations were subdivided into units within each of the 12 Soil Landscape Zones. I refer to these more finely discriminated units as sub-associations.

The objectives of this project entitled *Poorly conserved and potentially threatened vegetation types in the Western Australian wheatbelt* are:

- to identify vegetation types which are currently not represented or poorly represented in the conservation reserve system in the Agricultural Region;
- to identify those at greatest risk from rising water tables; and
- to identify remnant examples for on-ground inspection and possible acquisition, covenanting etc.

Four major outputs were envisaged:

- a list of the vegetation types of the South West Agricultural Region, derived from the 1:250,000 vegetation map database, and more finely discriminated where possible using Vegetation System boundaries and soil landform data;

- an assessment of the present reservation status of each vegetation type, derived by intersecting the vegetation map data with the cadastral data for the CALM estate;
- an assessment of potential threat to each vegetation type posed by rising water tables and salinisation, determined by intersecting the vegetation map with the digital elevation model (DEM) for the Region; and
- maps showing the patches of remnant vegetation within the distribution of each of those vegetation types which is under-represented in the CALM estate.

METHODS

The study area

This project focuses on that part of the South West Agricultural Region that is commonly known as the wheatbelt. In this part of the Region, the native vegetation has been extensively cleared for agriculture and, as a consequence of the clearing, there are problems of rising groundwater and the related problem of salinisation. The study area is the 12 major Soil Landscape Zones within the South West Agricultural Region where dryland salinity is considered to be a major problem. It excludes coastal zones which have maritime saline influences (Figure 1).

The data sets

Vegetation type and pre-European extent

The vegetation map database for Western Australia developed over the past 14 years is described in Hopkins *et al.* (1996), Hopkins *et al.* (in press), and Beard *et al.* (in press). In summary, the data set is based on the 1:250,000 scale mapping by J.S. Beard for the State, except the south west corner which was mapped by A.J.M. Hopkins in 1998/99. The primary vegetation units are vegetation associations *sensu* Beard and Webb (1974), but are equivalent to the sub-associations of the National Vegetation Information System (ERIN 1999). The individual polygons of each vegetation association have been captured digitally and attributed with data characterising the vegetation. It is being worked into a seamless coverage for the State. This data set is considered to best reflect pre-European vegetation patterns.

Present vegetation extent

Since European settlement, much of the original vegetation of the south west of Western Australia has been cleared for agriculture, resulting in a loss of biodiversity. Within the South West Agricultural Region, most of the native vegetation now exists only as isolated remnants, many of which occur on privately-owned land. A spatial database of present vegetation extent in the Intensive Land-Use Zone (South West Agricultural Region) is currently being developed for National Land and Water Resources Audit project DAW27 (Land-use and vegetation mapping: Western Australia). The data set builds on the work done for the Australian Land Cover Change Project (Barson *et al.* 2000) using the recent aerial photo coverage converted to digital orthophoto coverage (Beeston, Hopkins and Shepherd in preparation). The polygons of remnant vegetation are attributed with vegetation type data derived from the pre-European vegetation map coverage described above.

The area of present extent of each vegetation association for the whole of Western

Australia was calculated as the pre European extent in the whole of Western Australia minus pre-European extent in the South West Agricultural Region plus the present extent in South West Agricultural Region.

Soil landscapes

Over south-western Australia, draft soil landscape mapping at the systems level is available (N Schoknecht, Agriculture WA personal communication, June 2000). These soil landscape systems have been proportionally attributed with WA Soil Groups (Schoknecht 1999). From this it was possible to identify those systems in which saline soils (Salt Lake Soils and Saline Wet Soils) are apparently present. For the current purpose, each system was assigned to one of four classes according to the percentage of these saline soils attributed (0%, 0-10%, 10-30% and >30%). Only soil landscapes with saline components of 10 - 30% and >30% have been use in the anaysis for this project.

The soil landscapes have been grouped into Soil Landscape Zones (Figure 1): these have been used to define the study area.

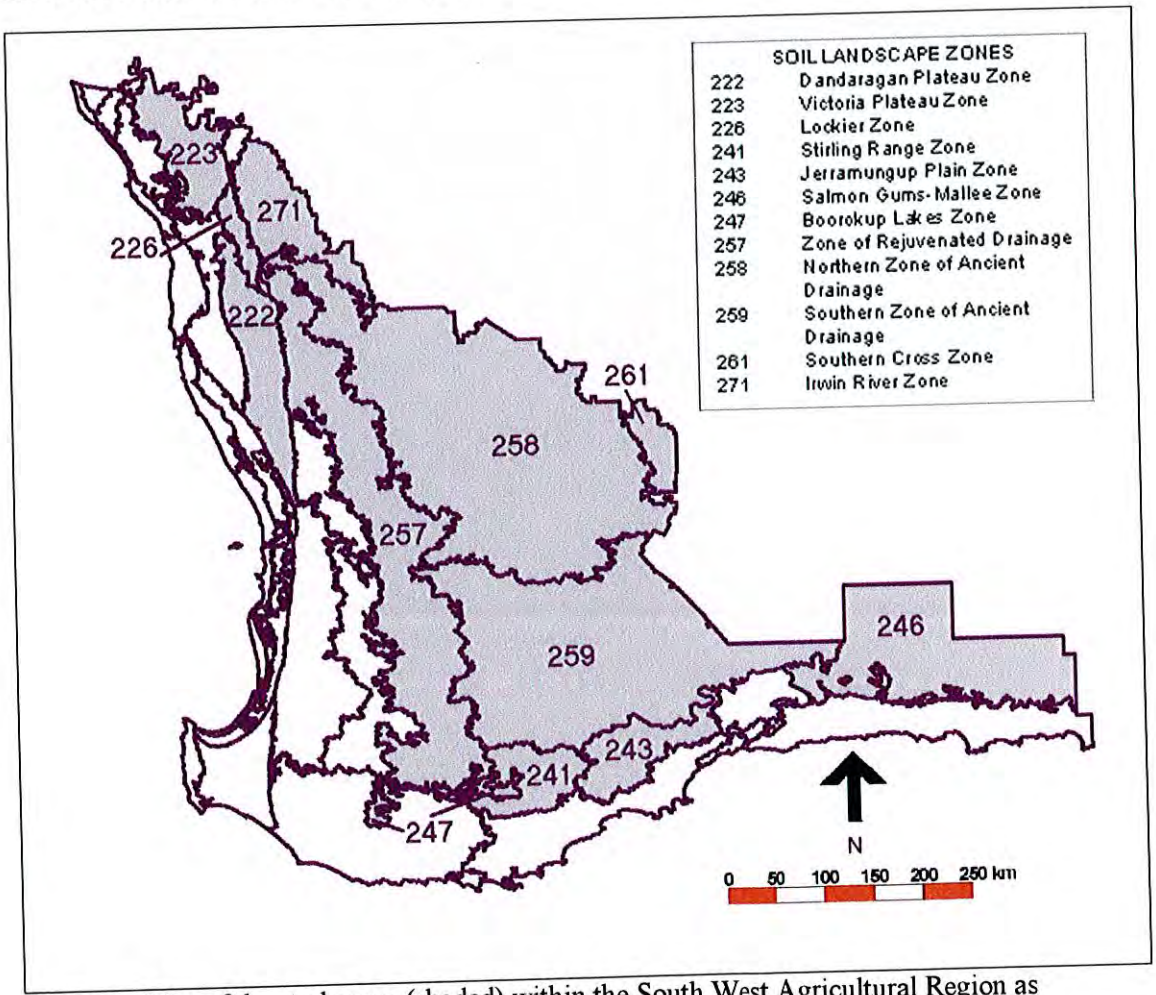

Figure 1. Map of the study area (shaded) within the South West Agricultural Region as defined by Soil Landscape Zones.

Conservation estate

The Department of Conservation and Land Management holds an up-to-date set of cadastral data for all lands and waters managed by the Department in a dedicated database – TENIS, CALM's Tenure Information System (Bowen 1995). A comprehensive database sits behind the cadasta – this contains information on vesting,

purpose and classification, and allows each parcel of land to be assigned to an IUCN reserve category (see IUCN 1994). This database was used for the conservation assessments reported here.

Analyses

The vegetation type and extent, soils and CALM-managed lands data are held as vector data, feature coded and attributed in an ORACLE database linked to Integraph's Modular GIS Environment (MGE). In order to perform analyses, it is necessary to create a topology. This topological file contains the mathematical representations of the spatial relationships that exist between graphical features; it also contains the original pointer to the data linkages from the graphical features to the relational database.

Topology files of the four discrete, spatially co-registered area-themes, pre-European vegetation, present vegetation extent, saline soils and cadastral boundaries of the CALM-managed estate, were built and those four themes were overlaid and intersected in pairs, using the Modular GIS Analysis (MGA) module of MGE to produce a further topological file describing the results of the intersection for example, the faces of vegetation units within the CALM-managed estate. The new topologies and the linked tables were used to generate a series of reports. The data from these reports were taken into a spreadsheet program for further sorting and minor computation. The maps presented in this report were prepared using Integraph's Geomedia software. This software was used to display the results of the analyses carried out in MGE, generate thematic maps and produce the mapping products included in this report.

RESULTS

Some 236 vegetation associations were analysed in Phase I of this project. These are listed in Table 1. Included in the list are a number of sparsely-vegetated units such as bare ground and granite rock that are considered to support unique vegetation but in relatively limited amounts. The sparsely-vegetated units are referred to as vegetation associations for ease of discussion. It also includes some units, which are extensive outside the Agricultural Zone and only have a small area in the study area.

Also shown in Table 1 are the results of the intersection of pre-European vegetation type and extent with the present vegetation extent. Ninety-two vegetation associations have <10% of their original extent remaining. An additional 71 vegetation associations have ≥ 10% but <30% of their original extent remaining. Ninety four vegetation associations have less than 2,000 ha remaining in the South West Agricultural Region and a total existing vegetation of less than 50,000 ha. Many of these include associations that are greatly reduced in extent. These vegetation associations are identified with the letter a, b and/or c respectively in the right column. Code d was used to identify vegetation associations with a present total extent of >50,000 ha.

Table 1. Pre-European and present extent Vegetation Associations occurring in the South West Agricultural Region of Western Australia ordered Vegetation Association Number. Codes are: a = vegetation association with <10% of their original areal extent remaining, b = vegetation association with <30% of their original areal extent remaining, c = vegetation association with a present extent of <2,000 ha in the Agricultural Zones and d= Vegetation Associations with >50,000 ha remaining in all of WA.

Veg Assoc	Beard Code	Description	Present extent in WA	Pre European Veg in Agric Region	Present Extent Agric Region	% Existing Veg in Agric Region	Code
3	e2,3Mc	Medium forest; jarrah (E. marginata)-marri (E. calophylla)	6582495	51000	20534	40.26	d
4	e3,5Mi	Medium woodland; marri (E. calophylla) & wandoo (E. wandoo)	1262778	416249	60813	14.61	b d
5	e5,45Mi	Medium woodland; wandoo (E. wandoo) & powderbark (E. accedens)	38555	42883	22422	52.29	
7	e5,6Mi	Medium woodland; York gum (E. loxophleba) & wandoo (E. wandoo)	75796	211305	20958	9.92	a d
8	e8,34Mi	Medium woodland; salmon gum (E. salmonophloia) & gimlet (E. salubris)	623009	496392	29111	5.86	a d
9	e12,13Mi	Medium woodland; coral gum (E. toquata) & goldfields blackbutt (E. le soufii) (also some redwood (E. transcontinentalis) & merrit (E. floctoniae))	225583	38808	382	0.98	a c d
10	e22Mi	Medium woodland; red mallee (E. oleosa group) group	101646	48323	231	0.48	a c d
13	e5Mr	Medium open woodland; wandoo (E. wandoo)	5960	5135	3720	72.44	
14	e2Lc	Low forest; jarrah (E. marginata)	189992	293	127	43.29	c d
25	c5e6Li	Low woodland; Allocasuarina huegeliana & York gum (E. loxophleba)	3727	6774	817	12.06	b c
27	mLi	Low woodland; paperbark (Melaleuca sp.)	417962	18002	10324	57.35	d
31	e6Mr m5Sc	Shrublands; Melaleuca thyoides thicket with scattered York gum (E. loxophleba)	721	2833	699	24.67	b c
35	e6Mr a19Si	Shrublands; jam (A. acuminata) scrub with scattered York gum (E. loxophleba)	189766	19702	2780	14.11	b d
36	acSc	Shrublands; thicket, acacia-casuarina alliance ?species	171742	167668	18570	11.08	b d
37	mSc	Shrublands; teatree thicket	83869	8576	1730	20.17	b c d
38	xSc	Shrublands; thicket, mixed	2414	2352	2324	98.80	
40	anSi	Shrublands; acacia scrub, various species	553740	2783	678	24.36	b c d
41	mSi	Shrublands; teatree scrub	188581	19722	5623	28.51	b d
47	e26SZc	Shrublands; tallerack (E. tetragona) mallee-heath	1177609	248956	78378	31.48	d
48	xSZc	Shrublands; scrub-heath	20731	3351	815	24.32	b c
49	xZc	Shrublands; mixed heath	52398	22464	7453	33.18	d
51	xGc	Sedgeland; reed swamps, occasionally with heath	179558	2210	878	39.73	c d
123	c2Lr k1,2Ci	Succulent steppe with open low woodland; sheoak over saltbush & bluebush	9144	36	0	0.00	a c
125	sl	Bare and poorly vegetated areas; salt lakes, lagoons &claypans	3384126	312412	10240	3.28	a d
126	fl	Bare and poorly vegetated areas; freshwater lakes	226915	6871	1528	22.24	b c d
127	mud	Bare and poorly vegetated areas; mudflats	760310	211	0	0.00	a c d
128	r	Bare and poorly vegetated areas; rock outcrops	274546	77567	23868	30.77	d
129	ds	Bare and poorly vegetated areas; sand	122961	35	1	2.86	a c d
131	e8,34Mi/e10,27Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & gimlet (E. salubris) / Shrublands; mallee scrub, redwood (E. transcontinentalis) & balck marlock (E. redunca)	11420	198070	11420	5.77	a
141	e6,8,34Mi	Medium woodland; York gum (E. loxophleba), salmon gum (E. salmonophloia) &	228422	365982	11269	3.08	a d

Table 1 continued

Veg Assoc	Beard Code	Description	Present extent in WA	Pre European Veg in Agric Region	Present Extent Agric Region	% Existing Veg in Agric Region	Code
		gimlet (E. salubris)					
142	e6,8Mi	Medium woodland; York gum (E. loxophleba) & salmon gum (E. salmonophloia)	227777	745149	37717	5.06	a d
145	e6,8Mi/amcSc	Mosaic: Medium woodland; York gum (E. loxophleba) & salmon gum (E. salmonophloia) / Shrublands; thicket, acacia-casuarina-melaleuca alliance	406	8130	406	4.99	a c
147	aSi k1Ci	Succulent steppe with scrub; acacia species over saltbush	25981	4910	0	0.00	a c
221	k1Ci	Succulent steppe; saltbush	54570	4347	65	1.50	a c d
254	e5,45Lr m6Sc	Shrublands; Melaleuca uncinata thicket with scattered wandoo (E. wandoo) and powderbark wandoo (E. astringens)	152	364	152	41.80	c
308	a8Sp/k1,2Ci	Mosaic: Shrublands; A. sclerosperma sparse scrub / Succulent steppe; saltbush & bluebush	457011	4335	68	1.57	a c d
325	k1,3Ci	Succulent steppe; saltbush & samphire	59215	7495	860	11.47	b c d
351	e6,22Mr eaSi	Shrublands; mallee & acacia scrub with scattered York gum (E. loxophleba) & red mallee (E. oleosa group)	383	8487	374	4.41	a c
352	e6Mi	Medium woodland; York gum (E. loxophleba)	183077	691739	43336	6.26	a d
353	e6Mr eaSi	Shrublands; mallee & acacia scrub with scattered York gum (E. loxophleba)	18027	78380	3675	4.69	a
354	e6Mr a19,23Si	Shrublands; jam (A. acuminata) and A. rostellifera (+hakea?) scrub with scattered York gum (E. loxophleba)	15892	82784	4617	5.58	a
355	e6,22Lr a9,19Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & jam (A. acuminata) scrub with scattered York gum (E. loxophleba) & red mallee (E. oleosa group)	59905	2674	151	5.65	a c d
356	eMr k1Ci	Succulent steppe with open woodland; eucalypts over saltbush	1094	3332	67	2.01	a c
358	a9,14Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & A. quadrimarginea on stony ridges	272	272	179	65.81	c d
364	ceLr a9Si	Shrublands; bowgada (A. ramulosa-A.linophylla) scrub with scattered eucalypts & cypress pine (Callitris columellaris)	515193	2405	0	0.00	a c d
365	e6,22Mr a9,19Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & jam (A. acuminata) scrub with scattered York gum (E. loxophleba) & red mallee (E. oleosa group)	51442	5924	1098	18.53	b c d
372	x3SZc/acSc	Mosaic: Shrublands; scrub-heath on deep sandy flats / Shrublands; thicket, acacia-casuarina alliance	28199	60703	5741	9.46	a
374	e6Lr a9Si	Shrublands; bowgada (A. ramulosa-A.linophylla) scrub with scattered York gum (E. loxophleba)	5962	1989	173	8.70	a c
379	x4SZc	Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region	311356	277931	19359	6.97	a d
380	x3SZc	Shrublands; scrub-heath on sandplain	303163	259132	22192	8.56	a d
385	e6Mr a9,19Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & jam (A. acuminata) scrub with scattered York gum (E. loxophleba)	30000	17063	20	0.12	a c
391	m6Sc	Shrublands; Melaeuca uncinata thicket	2255	2446	1389	56.79	c
392	m5Sc	Shrublands; Melaeuca thyioides thicket	2198	2233	875	39.18	c

Table 1 continued

Veg Assoc	Beard Code	Description	Present extent in WA	Pre European Veg in Agric Region	Present Extent Agric Region	% Existing Veg in Agric Region	Code
404	a9,20Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & A. murrayana scrub	199921	3397	348	10.24	b c d
405	a8,9,19Si	Shrublands; A. sclerosperma, bowgada (A. ramulosa-A.linophylla) & jam (A. acuminata) scrub	24959	995	0	0.00	a c
406	ace70b4xSc	Shrublands; acacia, casuarina, E. eudesmioides, Banksia ashbyi & other mixed species thicket	153865	1461	0	0.00	a c d
407	c5Li a19Si	Low woodland over scrub; Allocasuarina heugeliana over jam (A. acuminata) scrub	32394	240	18	7.51	a c
408	x2SZc	Shrublands; scrub-heath on coastal association, yellow sandplain	248292	101449	3984	3.93	a d
412	mSi k3Ci	Succulent steppe with scrub; teatree (Melaleuca thyioides?) over samphire	5585	4381	390	8.90	a c
413	a33Sc	Shrublands; A. neurophylla & A. species thicket	2270	6835	347	5.08	a c
419	a9,19m6Sc	Shrublands; bowgada (A. ramulosa-A.linophylla), jam (A. acuminata) and Melaleuca uncinata thicket	299160	20493	2883	14.07	b d
420	a9,19Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & jam (A. acuminata) scrub	713604	36435	6133	16.83	b d
427	c5e6Mr a19Si	Shrublands; jam (A. acuminata) scrub with scattered Allocasuarina heugelliana & York gum (E. loxophleba)	36538	2815	0	0.00	a c
435	a33,34,35Sc	Shrublands; A. neurophylla, A. beauverdiana & A. resinomarginea thicket	849485	318086	16753	5.27	a d
437	anSc	Shrublands; Mixed acacia thicket on sandplain	324398	43992	6743	15.33	b d
438	dSi	Shrublands; dodonaea scrub	156	332	158	47.65	c
482	e11,22Mi	Medium woodland; merrit (E. floctoniae) & red mallee (E. oleosa group)	1431209	205083	11295	5.51	a d
486	e8,22Mi/e15Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & red mallee (E. oleosa group) / Shrublands; mallee scrub E. eremophila	163729	276636	27182	9.83	a d
493	e8Mi/e11,22 Mi	Medium woodland; salmon gum (E. salmonophloia) mixed with merrit (E. floctoniae) & red mallee (E. oleosa group)	13800	5820	0	0.00	a c
511	e8,9Mi	Medium woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis)	225834	191354	28013	14.64	b d
512	e15,32Si	Shrublands; mallee scrub, E. eremophila & Forrest's marlock (E. forrestianna)	68332	213340	34500	16.17	b d
516	e27Si	Shrublands; mallee scrub, balck marlock (E. reduncа)	706430	831757	157462	18.93	b d
518	e11,12Mi/e15 Si	Mosaic: Medium woodland; merrit (E. floctoniae) & coral gum (E. toquata) / Shrublands; mallee scrub E. eremophila	633837	24739	0	0.00	a c d
519	e15Si	Shrublands; mallee scrub, E. eremophila	810232	1355260	253514	18.71	b d
520	a14Sc	Shrublands; A. quadrimarginea thicket	35058	135	0	0.00	a c
521	e8,22Mi	Medium woodland; salmon gum (E. salmonophloia) & red mallee (E. oleosa group)	109479	13684	0	0.00	a c d
522	e10,11Mi	Medium woodland; redwood (E. transcontinentalis) & merrit (E. floctoniae)	671961	35319	0	0.00	a c d
524	e14,22Mi	Medium woodland; Dundas blackbutt (E. dundasii) & red mallee (E. oleosa group)	344726	2186	0	0.00	a c d
536	e9,35Mi	Medium woodland; morrel (E. longicornis) & rough fruited mallee (E. corrugata)	10231	13781	3986	28.92	b
537	e9Mi	Medium woodland; morrel (E. longicornis)	263	437	0	0.00	a c
538	a15Si	Shrublands; A. brachystachya scrub	145310	6608	0	0.00	a c d
551	c3Sc	Shrublands; Allocasuarina campestris thicket	83940	280702	39739	14.16	b d
552	c4Sc	Shrublands; Allocasuarina acutivalvus & calothamnus (also melalueca) thicket on	35533	3167	1290	40.73	c

Table 1 continued

Veg Assoc	Beard Code	Description	Present extent in WA	Pre European Veg in Agric Region	Present Extent Agric Region	% Existing Veg in Agric Region	Code
		greenstone hills					
631	e6Mi m5Sc k3Ci	Succulent steppe with woodland and thicket; York gum (E. loxophleba) over Melaleuca thyoides & samphire	27263	89307	7413	8.30	a
675	mhSc	Shrublands; mixed thicket (melaluca & hakea?)	63005	1819	304	16.72	b c d
676	k3Ci	Succulent steppe; samphire	1862674	16522	471	2.85	a c d
684	e6Mr a19Si/c3Sc	Mosaic: Shrublands; Shrublands; jam (A. acuminata) scrub with scattered York gum (E. loxophleba) in the valleys / Allocasuarina campestris thicket	30724	127189	29589	23.26	b
686	e6,22Mi	Medium woodland; York gum (E. loxophleba) & red mallee (E. oleosa group)	8141	5890	953	16.18	b c
687	e6c5Mr a9,19Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & jam (A. acuminata) scrub with scattered Allocasuarina heugelliana & York gum (E. loxophleba)	46316	17062	2370	13.89	b
691	edSc	Shrublands; Dryandra quercifolia & Eucalytpus spp. thicket	53319	10101	786	7.78	a c d
692	cmSc	Shrublands; casuarina & melaleuca thicket	1928	2918	1948	66.75	c
693	c5Li eaSi/c3Sc	Mosaic: Low woodland: Allocasuarina heugeliana over mallee and acacia scrub / Allocasuarina campestris thicket	3153	4377	3106	70.96	
694	x8SZc	Shrublands; scrub-heath on yellow sandplain banksia-xylomelum alliance in the Geraldton Sandplain & Avon-Wheatbelt Regions	64671	348888	64483	18.48	b d
695	c3Si	Shrublands; Allocasuarina campestris scrub	49	667	62	9.29	a c
696	e5,45Li cdSc	Shrublands; casuarina & dryandra thicket with wandoo (E. wandoo) and powderbark wandoo (E. astringens)	1236	3089	1221	39.53	c
697	x7SZc	Shrublands; scrub-heath on lateritic sandplain in the southern Geraldton Sandplain Region	11975	74017	11937	16.13	b
698	x9SZc/e5,45Lp	Mosaic: Shrublands; scrub-heath Dryandra-Calothamnus assoc. with B. prionotes on limestone in the northern Swan Region / Sparse low woodland; wandoo (E. wandoo) & powderbark wandoo (E. wandoo)	1587	11495	1586	13.80	b c
924	e15,22Si	Shrublands; mallee scrub, E. eremophila & red mallee (E. oleosa group)	16188	81462	15097	18.53	b
925	e22Si	Shrublands; mallee scrub, red mallee (E. oleosa group)	29292	5159	3499	67.82	
929	e33Lc	Low forest; moort (E. platypus)	11667	1689	627	37.13	c
931	e7Mi	Medium woodland; yate (E. occidentalis)	24367	20473	7653	37.38	
934	e28Si	Shrublands; mallee scrub E. nutans	92048	1455	557	38.29	c d
936	e8Mi	Medium woodland; salmon gum (E. salmonophloia)	849523	76057	12336	16.22	b d
938	e6,7Mi	Medium woodland; York gum (E. loxophleba) & yate (E. occidentalis)	23320	70063	13153	18.77	b
939	e6Mi mSp k3Ci	Succulent steppe with woodland; yorkgum, sparse teatree scrub & samphire	10	116	10	8.63	a c
940	e27Si/e26SZc	Mosaic: Shrublands; mallee scrub, balck marlock (E. redunca) / Shrublands; tallerack (E. tetragona) mallee-heath	129460	233298	82738	35.46	d
941	e8,9Mi/e10Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Shrublands; mallee scrub, redwood (E. transcontinentalis)	14836	23560	4005	17.00	b

Table 1 continued

Veg Assoc	Beard Code	Description	Present extent in WA	Pre European Veg in Agric Region	Present Extent Agric Region	% Existing Veg in Agric Region	Code
942	e7Mi/e27Si	Mosaic: Medium woodland; yate (E. occidentalis) / Shrublands; mallee scrub, balck marlock (E. redunca)	8476	33546	8455	25.20	b
945	e8Mi/e10,27Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) / Shrublands; mallee scrub, redwood (E. transcontinentalis) & balck marlock (E. redunca) =131	21483	176207	12196	6.92	a
946	e5Mi	Medium woodland; wandoo (E. wandoo)	22694	74318	11519	15.50	b
947	e64,45Mi	Medium woodland; powderbark & mallet	12385	31828	11413	35.86	
948	e6,18Mr	Medium woodland; York gum (E. loxophleba) & river gum (E. rudis or E. camaldulensis)	144	1449	144	9.93	a c
949	bLi	Low woodland; banksia	277063	40241	17944	44.59	d
950	c6Mi	Medium woodland; Casuarina obesa	163	507	163	32.16	c
951	e6,66Mp mSc k3Ci	Succulent steppe with sparse woodland & thicket; York gum (E. loxophleba) & Kondinin blackbutt over teatree thicket & samphire	1822	27576	1727	6.26	a c
952	dZc	Shrublands; dryandra heath	10286	59368	9719	16.37	b
953	mSc k3Ci	Succulent steppe with thicket; teatree over samphire (m5?)	918	10019	918	9.16	a c
954	a19c5Si	Shrublands; thicket, jam (A. acuminata) & Allocasuarina huegeliana	1110	5832	1159	19.87	b c
955	x10SZc/c3Sc	Mosaic: Shrublands; scrub-heath (SE Avon)/ Shrublands; Allocasuarina campestris thicket	10357	138246	10434	7.55	a
956	e5Mr c3Sc	Shrublands; Allocasuarina campestris thicket with scattered wandoo (E. wandoo)	2695	25306	2715	10.73	b
959	e36,66Mp mSc k3Ci	Succulent steppe with sparse woodland & thicket; yorrell (E.gracilis) & Kondinin blackbutt over teatree & samphire	1641	13209	1641	12.42	b c
960	e10,27Si	Shrublands; mallee scrub, redwood (E. transcontinentalis) & balck marlock (E. redunca)	14377	159165	14377	9.03	a
961	x10SZc/c4Sc	Mosaic: Shrublands; scrub-heath (SE Avon)/ Shrublands; Allocasuarina acutivalvis thicket	4315	25002	4315	17.26	b
962	e64Mi	Medium woodland; mallet (E. astringens)	231	1219	232	19.04	b c
963	e7mMi	Medium woodland; yate (E. occidentalis) & paperbark (Melaleuca spp)	4358	4086	1257	30.76	c
965	e2,3Mi	Medium woodland; jarrah (E. marginata) & marri (E. calophylla)	12451	2738	1431	52.26	c
966	e8,9Mp mSc k3Ci	Succulent steppe with sparse woodland & thicket; salmon gum (E. salmonophloia) & morrel (E. longicornis) over teatree & samphire	84	3231	84	2.60	a c
967	e5,7Mi	Medium woodland; wandoo (E. wandoo) & yate (E. occidentalis)	64885	189222	28795	15.22	b d
968	e2,3,5Mi	Medium woodland; jarrah (E. marginata), marri (E. calophylla) & wandoo (E. wandoo)	211202	31302	13428	42.90	d
970	e2,67Lc	Low forest; jarrah (E. marginata) & E. decipiens	1383	1393	1383	99.31	c
974	e6,8,9Mi	Medium woodland; York gum (E. loxophleba), salmon gum (E. salmonophloia) & morrel (E. longicornis)	698	7267	698	9.60	a c
975	e2Li	Low woodland; jarrah (E. marginata)	31722	9855	9309	94.46	
976	mLi k3Ci	Succulent steppe with low woodland; myoporum over samphire	586	2172	586	26.98	b c
980	e2SZc	Shrublands; jarrah (E. marginata) mallee-heath	215382	39749	39547	99.49	d

Table 1 continued

Veg Assoc	Beard Code	Description	Present extent in WA	Pre European Veg in Agric Region	Present Extent Agric Region	% Existing Veg in Agric Region	Code
981	e5,6,7Mi	Medium woodland; wandoo (E. wandoo),York gum (E. loxophleba) & yate (E. occidentalis)	1174	10591	1174	11.08	b c
982	e67Li	Low woodland; E. decipiens	1360	902	620	68.73	c
986	enSZc	Shrublands; mallee-heath (Stirling Ra.)	16975	28359	13353	47.09	
987	e2,5Mi	Medium woodland; jarrah (E. marginata) & wandoo (E. wandoo)	4231	791	764	96.64	c
988	m5Sc k3Ci	Succulent steppe with thicket; Melaleuca thyoides over samphire	8123	97429	5156	5.29	a
991	e5Mi	Medium woodland; small wandoo (E. wandoo) patches surrounded by e2, 5Mi; e5, 7Mi	324	237	233	98.47	c
992	e2,5Mc	Medium forest; jarrah (E. marginata) & wandoo (E. wandoo) (E. wandoo (E. wandoo))	269428	20665	5121	24.78	b d
993	c5e6Mi	Medium woodland; York gum (E. loxophleba) & Allocasuarina huegeliana	717	2109	717	34.00	c
999	e3Mi	Medium woodland; marri (E. calophylla)	213223	98429	12676	12.88	b d
1003	e2,3,5Mc	Medium forest; jarrah (E. marginata), marri (E. calophylla) & wandoo (E. wandoo)	127650	11472	7268	63.35	d
1004	e5Mr/xZc	Mosaic: Medium open woodland; wandoo (E. wandoo) / Shrublands; mixed heath	4430	9251	3435	37.13	
1005	c5Li	Low woodland; Allocasuarina huegeliana	478	530	75	14.15	b c
1006	e2,5,45Mi	Medium woodland; jarrah (E. marginata), wandoo (E. wandoo) & powderbark	67922	1360	593	43.60	c d
1008	e3Mr	Medium open woodland; marri (E. calophylla)	4292	1389	55	3.96	a c
1014	bLi/mSc	Mosaic: Low woodland; banksia / Shrublands; teatree thicket	63089	178	7	3.93	a c d
1015	x14SZc/dZc	Mosaic: Shrublands; scrub-heath on the Swan Coastal Plain / Shrublands; dryandra heath	6907	19326	6339	32.80	
1016	bLi/dZc	Mosaic: Low woodland; banksia / Shrublands; dryandra heath	87	1455	0	0.00	a c
1017	e2,3Mr bLi	Medium open woodland; jarrah (E. marginata) & marri (E. calophylla), with low woodland; banksia	22780	5799	2063	35.58	
1018	e2,3Mi/bLi/mLc/c6Li	Mosaic: Medium forest; jarrah (E. marginata), marri (E. calophylla) / Low woodland; banksia / Low forest; teatree / Low woodland; Casuarina obesa	17571	50	24	48.02	c
1019	e2,3Mp	Medium sparse woodland; jarrah (E. marginata) & marri (E. calophylla)	491	653	319	48.83	c
1020	e2,3Mc/e3,5Mi	Mosaic: Medium forest; jarrah (E. marginata), marri (E. calophylla) / Medium woodland; marri (E. calophylla)-wandoo (E. wandoo)	2622	4937	1732	35.08	c
1021	e5Mr/dZc	Mosaic: Medium open woodland; wandoo (E. wandoo) / Shrublands; dryandra heath	1411	16	6	37.25	c
1022	c6Mi k3Ci	Succulent steppe with woodland; Casuarina obesa & samphire	37	460	33	7.17	a c
1023	e5,6,8Mi	Medium woodland; York gum (E. loxophleba), wandoo (E. wandoo) & salmon gum (E. salmonophloia) (E. salmonophloia)	97966	1351338	96640	7.15	a d
1024	ecSc	Shrublands; mallee & casuarina thicket	72021	718571	52412	7.29	a d
1025	e6,8,9Mi/k1,3Ci	Mosaic: Medium woodland; York gum (E. loxophleba), salmon gum (E. salmonophloia) & morrel (E. longicornis) / Succulent steppe; saltbush & samphire	51	1942	40	2.06	a c
1027	e2,3Mr bLi/e2,3,Mp	Mosaic: Medium open woodland; jarrah (E. marginata) & marri (E. calophylla), with low woodland; banksia / Medium sparse woodland; jarrah (E. marginata) & marri (E. calophylla)	22718	39613	21871	55.21	
1028	e18Mi	Medium woodland; river gum (E. rudis)	1579	73	67	92.01	c

Table 1 continued

Veg Assoc	Beard Code	Description	Present extent in WA	Pre European Veg in Agric Region	Present Extent Agric Region	% Existing Veg in Agric Region	Code
1030	b1,2Li	Low woodland; Banksia attenuata & B. menziesii	210428	21647	6593	30.46	d
1031	hSZc/dZc	Mosaic: Shrublands; hakea scrub-heath / Shrublands; dryandra heath	299830	68084	30404	44.66	d
1035	e3Mr/dZc	Mosaic: Medium open woodland; marri (E. calophylla) / Shrublands; dryandra heath	1551	4189	503	12.01	b c
1036	b3Li	Low woodland; Banksia prionotes	31966	87256	31975	36.64	
1037	e6,18Mi	Medium woodland; York gum (E. loxophleba) & river gum (E. rudis or E. camaldulensis)	2184	2399	2177	90.75	
1038	eMr b1,2Li	Medium open woodland; eucalypts, with low woodland; Banksia attenuata & B. menziesii	293	1729	304	17.58	b c
1039	e6Mr eSi	Shrublands; mallee with scattered York gum (E. loxophleba)	1192	2059	1178	57.21	c
1040	c6e6Mi	Medium woodland; York gum (E. loxophleba) & Casuarina obesa	533	2855	526	18.42	b c
1041	c5a19Li	Low woodland; Allocasuarina huegeliana & jam (A. acuminata)	1199	4809	1220	25.37	b c
1042	cLi k3Ci	Succulent steppe with low woodland; sheoak over samphire	2	272	12	4.41	a c
1043	e5,45Mr/dZc	Mosaic: Medium open woodland; wandoo (E. wandoo) & powderbark wandoo (E. astringens) / Shrublands; dryandra heath	5447	21	10	47.03	c
1044	e6,8Mi/m5Sc	Mosaic: Medium woodland; York gum (E. loxophleba) & salmon gum (E. salmonophloia) / Shrublands; Melaleuca thyioides thicket	147	1457	125	8.58	a c
1046	e6Mi k3Ci	Succulent steppe with woodland; York gum (E. loxophleba) & samphire	159	783	64	8.17	a c
1047	e29SZc	Shrublands; E. incrassata mallee-heath	210925	16237	2639	16.25	b d
1048	mSp/k3Ci	Mosaic: Shrublands; melaleuca patchy scrub / Succulent steppe; samphire	229	11448	254	2.22	a c
1049	e5,6,8,9,34Mi	Medium woodland; wandoo (E. wandoo), York gum (E. loxophleba), salmon gum (E. salmonophloia), morrel (E. longicornis) & gimlet (E. salubris)	20904	649800	20631	3.17	a
1051	e5,7Mr mSc	Shrublands; teatree thicket with scattered wandoo (E. wandoo) & yate (E. occidentalis)	6947	12608	4172	33.09	
1053	e6Mr m6Sc	Shrublands; Melaleuca uncinata thicket with scattered York gum (E. loxophleba)	1178	13903	1168	8.40	a c
1055	e6,39Si	Shrublands; York gum (E. loxophleba) & E. sheathiana mallee scrub	14156	126695	13255	10.46	b
1056	ac3Sc	Shrublands; thicket, acacia & Allocasuarina campestris	3122	20951	3113	14.86	b
1057	e8,34Mi/e6,39 Si	Mosaic: Shrublands; Medium woodland; salmon gum (E. salmonophloia) & gimlet (E. salubris) / York gum (E. loxophleba) & E. sheathiana mallee scrub (some wandoo (E. wandoo) may occur with gimlet (E. salubris))	18397	162952	9819	6.03	a
1058	e6,19Si	Shrublands; York gum (E. loxophleba) & E. gonglocarpa mallee scrub	254	9385	262	2.79	a c
1059	e8,34Mi/e9,39 Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & gimlet (E. salubris) /Shrublands; mallee E. longicornis & E. sheathiana scrub	31	2265	21	0.93	a c
1061	e8,36Mp/k1,3 Ci	Mosaic: Medium sparse woodland; salmon gum (E. salmonophloia) & yorrell (E.gracilis) / Succulent steppe; saltbush & samphire	5689	42869	5694	13.28	b
1062	e6Mr m5Sc k3Ci	Succulent steppe with open woodland & thicket; York gum (E. loxophleba) over Melaleuca thyiodes & samphire	2474	22598	2409	10.66	b
1063	e6pMLi	Medium-Low woodland; York gum (E. loxophleba) & cypress pine (Callitris columellaris)	162366	12028	1547	12.86	b c d

Table 1 continued

Veg Assoc	Beard Code	Description	Present extent in WA	Pre European Veg in Agric Region	Present Extent Agric Region	% Existing Veg in Agric Region	Code
1065	e5,34Mi/e6,39 Si	Mosaic: Medium woodland; wnadoo (E. wandoo) & gimlet (E. salubris)/Shrublands; York gum (E. loxophleba) gimlet (E. salubris) mallee scrub	438	8334	267	3.20	a c
1067	e8,9,34,35Mi	Medium woodland; salmon gum (E. salmonophloia), morrel (E. longicornis), gimlet (E. salubris) & rough fruited mallee (E. corrugata)	13294	5947	3859	64.89	
1068	e8,9,34,39Mi	Medium woodland; salmon gum (E. salmonophloia), morrel (E. longicornis), gimlet (E. salubris) & E. sheathiana	116332	159849	26077	16.31	b d
1071	aSi k1,2Ci	Succulent steppe with scrub; acacia species over saltbush & bluebush	897	67	0	0.00	a c
1073	e5,64Mi	Medium woodland; wandoo (E. wandoo) & mallet	7453	17007	6622	38.94	
1074	e5c6Mr mSc k3Ci	Succulent steppe with open woodland & thicket; wandoo (E. wandoo) & Allocasuarina obesa over teatree & samphire	1463	4626	1463	31.63	c
1075	e15,27Si	Shrublands; mallee scrub, E. eremophila & black marlock (E.redunca)	29714	337619	29714	8.80	a
1076	e8,9Mi/e15,24 Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Shrublands; mallee scrub E. eremophila & ?bloodwood E. dichromophloia	11	11	11	101.91	c
1077	e2,18Mi	Medium woodland; jarrah (E. marginata) & river gum (E. rudis)	1574	2332	1194	51.19	c
1079	e8,9Mr/k1Ci	Mosaic: Medium open woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Succulent steppe; saltbush	2107	13526	3657	27.04	b
1080	eSr m6Sc (k3Ci)	Succulent steppe with malle & thickets; Mallee and Melaleuca uncinata thickets on salt flats	121	3908	91	2.33	a c
1081	e9,39Si	Shrublands; mallee scrub, E. longicornis & E. sheathiana	14	14	14	97.99	c
1083	e5,8c6Mr mSi k3Ci	Succulent steppe with open woodland & scrub; wandoo (E. wandoo), salmon gum (E. salmonophloia) & Casuarina obesa over teatree & samphire	2470	10738	2470	23.00	b
1085	e5,69Mi	Medium woodland; wandoo (E. wandoo) & blue mallet (E. gardneri)	5371	52126	5371	10.30	b
1087	e5,9,69Mi	Medium woodland; wandoo (E. wandoo), morrel (E. longicornis) & blue mallet	261	750	261	34.78	c
1088	e64,69 Mi	Medium woodland; mallet & blue mallet	150	400	150	37.50	c
1091	b3c5Li	Low woodland; Banksia prionotes & Allocasuarina huegelianna	266	723	266	36.81	c
1092	e5,6,9 Mi	Medium woodland; wandoo (E. wandoo), York gum (E. loxophleba) & morrel (E. longicornis)	5674	78484	5674	7.23	a
1093	ec6Mr mSc k3Ci	Succulent steppe with open woodland & thicket; eucalypts & Casuarina obesa over teatree & samphire	742	8299	742	8.94	a c
1094	e6,8Mi/e15,27 Si	Mosaic: Medium woodland; York gum (E. loxophleba) & salmon gum (E. salmonophloia) / Shrublands; mallee scrub E. eremophila & balck marlock (E. redunca)	4479	73112	4479	6.13	a
1095	e6,7,8Mi	Medium woodland; York gum (E. loxophleba), yate (E. occidentalis) & salmon gum (E. salmonophloia)	322	1227	322	26.24	b c
1096	e7,8Mi	Medium woodland; yate (E. occidentalis) & salmon gum (E. salmonophloia)	180	354	180	50.89	c
1098	e8,9Mp/k3Ci	Mosaic: Medium sparse woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Succulent steppe; samphire	1953	18236	1953	10.71	b c
1111	e37Mi	Medium woodland; yate (E. occidentalis)	4023	162	67	41.27	c

Table 1 continued

Veg Assoc	Beard Code	Description	Present extent in WA	Pre European Veg in Agric Region	Present Extent Agric Region	% Existing Veg in Agric Region	Code
1134	e2Mi	Medium woodland; jarrah (E. marginata) (south coast)	111321	5562	3702	66.55	d
1143	c3Sc xZi	Shrublands; Allocasuarina campestris thicket with patches of heath	1967	66231	1956	2.95	a c
1147	x10SZc	Shrublands; scrub-heath in the south-east Avon-Wheatbelt Region	2140	43704	2244	5.13	a
1148	x12SZc	Shrublands; scrub-heath in the Coolgardie Region	266365	7557	1903	25.18	b c d
1149	x19SZc	Shrublands; scrub-heath A.-Ecdeiocolia association in the south-east Geraldton Sandplain Region	366	7576	365	4.82	a c
1154	anSc xZi	Shrublands; A. thicket with patches of heath	3279	39478	3285	8.32	a
1155	e6Mi/c3Sc	Mosaic: Medium woodland; York gum (E. loxophleba) / Shrublands; Allocasuarina campestris thicket	3037	7871	3035	38.56	
1156	a19c5Lr cSc	Shrublands; Allocasuarina campestris thickets with scattered jam (A. acuminata) & casuarina	203	1749	213	12.18	b c
1164	x8SZc/c3Sc	Mosaic: Shrublands; scrub-heath on sandplain (banksia-xylomelum alliance) in the Geraldton Sandplain & Avon-Wheatbelt Regions / Shrublands; Allocasuarina campestris thicket	10	2024	20	0.99	a c
1198	m5Si k3Ci/a9Sr	Mosaic: Succulent steppe with thicket; Melaleuca thyiodes over samphire / Shrublands; bowgada (A. ramulosa-A.linophylla) open scrub	16863	1483	125	8.43	a c
1200	e8,9Mi/e15,27 Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Shrublands; mallee scrub E. eremophila & black marlock (E. redunca)	10213	125024	10213	8.17	a
1271	clay	Bare and poorly vegetated areas; claypans, =125	87098	629	389	61.83	c d
1413	acmSc	Shrublands; acacia, casuarina & melaleuca thicket	1267723	831228	138667	16.68	b d
1516	e27,32Si	Shrublands; mallee scrub, balck marlock (E. redunca) & Forrest's marlock (E. forrestiana)	34992	109838	13502	12.29	b
1519	e15,bSi	Shrublands; mallee scrub, E. eremophila & banksia	3297	3297	0	0.00	a c
1967	e5,7,18Mi	Medium woodland; wandoo (E. wandoo), yate (E. occidentalis) & river gum (E. rudis or E. camaldulensis)	5812	25734	5812	22.58	b
2047	c3dSc	Shrublands; tamma & dryandra thicket	982	1454	996	68.51	c
2048	x13SZc	Shrublands; scrub-heath in the Mallee Region	146064	216052	38291	17.72	b d
2081	a9Si	Shrublands; bowgada (A. ramulosa-A.linophylla) and associated spp. scrub	1337427	860	315	36.64	c d
2093	e7Mi mSi k3Ci	Succulent steppe with open woodland & scrub; yate (E. occidentalis) over teatree & samphire	2946	9296	2946	31.69	
3041	a19c5Li/rock	Mosaic: Low woodland; Allocasuarina huegeliana & jam (A. acuminata) around granite rocks	1487	6056	1487	24.55	b c
4048	x15SZc	Shrublands; scrub-heath in the Esperence Plains incl. Mt Ragged scrub-heath	90952	3945	503	12.75	b c d
5048	bISZc	Shrublands; banksia and lambertia scrub-heath in the Esperence Plains Region	28183	5097	630	12.36	b c
6048	bSZc	Shrublands; banksia scrub-heath on sandplain in the Esperence Plains Region	127094	2693	437	16.23	b c d

The results of conservation assessment are shown in Table 2. Eighty two vegetation associations are completely unrepresented in the conservation estate, which includes reserves that accord with IUCN Reserve Categories I - IV ie National Parks, Nature Reserves, Marine Parks, Marine Nature Reserves, Conservation Parks, and certain other categories of land managed for conservation by the Department of Conservation and Land Management (CALM). Fourteen more associations have a minor representation on other lands managed by CALM. An additional 110 vegetation associations have <15% of their original, pre-European extent in reserves that fall into IUCN Reserve Categories I – IV. The total number of associations (out of 236 analysed) that are poorly reserved is 210. Vegetation associations that are inadequately reserved are coded with the letter e, f or g for the classes of representation listed here.

Table 2. Reservation status of vegetation associations in the South West Agricultural Region of Western Australia (as at March 2000). Codes are e = vegetation association completely unrepresented in reserves in IUCN categories I- IV or in other CALM-managed lands, f = vegetation association unrepresented in reserves in IUCN categories I- IV reserves but <15% of their original areal extent in other CALM-managed lands, g = vegetation association inadequately represented in the conservation reserve system with <15% of their original areal extent in reserves in IUCN categories I- IV.

Veg Assoc	Beard Code	Description	Pre European Veg in Agric Zone	Extent IUCN	% IUCN	Extent CALM	% CALM	Codes*
3	e2,3Mc	Medium forest; jarrah (E. marginata)-marri (E. calophylla)	51000	2980	5.84	3287	6.44	g
4	e3,5Mi	Medium woodland; marri (E. calophylla) & wandoo (E. wandoo)	416249	2938	0.71	3250	0.78	g
5	e5,45Mi	Medium woodland; wandoo (E. wandoo) & powderbark (E. accedens)	42883	17538	40.90	17538	40.90	
7	e5,6Mi	Medium woodland; York gum (E. loxophleba) & wandoo (E. wandoo)	211305	153	0.07	311	0.15	g
8	e8,34Mi	Medium woodland; salmon gum (E. salmonophloia) & gimlet (E. salubris)	496392	6002	1.21	6002	1.21	g
9	e12,13Mi	Medium woodland; coral gum (E. toquata) & goldfields blackbutt (E. le soufii) (also some redwood (E. transcontinentalis) & merrit (E. floctoniae))	38808	0	0.00	0	0.00	e
10	e22Mi	Medium woodland; red mallee (E. oleosa group) group	48323	1119	2.31	1119	2.31	g
13	e5Mr	Medium open woodland; wandoo (E. wandoo)	5135	0	0.00	0	0.00	e
14	e2Lc	Low forest; jarrah (E. marginata)	293	6	1.88	6	1.88	g
25	c5e6Li	Low woodland; Allocasuarina huegeliana & York gum (E. loxophleba)	6774	37	0.55	37	0.55	g
27	mLi	Low woodland; paperbark (Melaleuca sp.)	18002	2583	14.35	3327	18.48	g
31	e6Mr m5Sc	Shrublands; Melaleuca thyoides thicket with scattered York gum (E. loxophleba)	2833	373	13.16	376	13.27	g
35	e6Mr a19Si	Shrublands; jam (A. acuminata) scrub with scattered York gum (E. loxophleba)	19702	88	0.45	299	1.52	g
36	acSc	Shrublands; thicket, acacia-casuarina alliance ?species	167668	2636	1.57	2672	1.59	g
37	mSc	Shrublands; teatree thicket	8576	1005	11.72	1005	11.72	g
38	xSc	Shrublands; thicket, mixed	2352	2331	99.08	2331	99.08	
40	anSi	Shrublands; acacia scrub, various species	2783	0	0.00	0	0.00	e
41	mSi	Shrublands; teatree scrub	19722	6543	33.18	8608	43.65	
47	e26SZc	Shrublands; tallerack (E. tetragona) mallee-heath	248956	41964	16.86	44956	18.06	
48	xSZc	Shrublands; scrub-heath	3351	492	14.67	492	14.67	g
49	xZc	Shrublands; mixed heath	22464	1087	4.84	1087	4.84	g
51	xGc	Sedgeland; reed swamps, occasionally with heath	2210	1194	54.01	1194	54.01	
123	c2Lr k1,2Ci	Succulent steppe with open low woodland; sheoak over saltbush & bluebush	36	0	0.00	0	0.00	e
125	sl	Bare and poorly vegetated areas; salt lakes, lagoons &claypans	312412	64675	20.70	65081	20.83	
126	fl	Bare and poorly vegetated areas; freshwater lakes	6871	5960	86.74	6182	89.97	
127	mud	Bare and poorly vegetated areas; mudflats	211	0	0.00	0	0.00	e
128	r	Bare and poorly vegetated areas; rock outcrops	77567	7039	9.07	7211	9.30	g
129	ds	Bare and poorly vegetated areas; sand	35	0	0.00	0	0.00	e
131	e8,34Mi/e10,27 Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & gimlet (E. salubris) / Shrublands; mallee scrub, redwood (E. transcontinentalis) & balck marlock (E. redunca)	198070	1678	0.85	1678	0.85	g
141	e6,8,34Mi	Medium woodland; York gum (E. loxophleba), salmon gum (E. salmonophloia) & gimlet (E. salubris)	365982	2400	0.66	2400	0.66	g
142	e6,8Mi	Medium woodland; York gum (E. loxophleba) & salmon gum (E. salmonophloia)	745149	2737	0.37	2998	0.40	g
145	e6,8Mi/amcSc	Mosaic: Medium woodland; York gum (E. loxophleba) & salmon gum (E. salmonophloia) / Shrublands; thicket, acacia-casuarina-melaleuca alliance	8130	0	0.00	0	0.00	e
147	aSi k1Ci	Succulent steppe with scrub; acacia species over saltbush	4910	52	1.05	52	1.05	g
221	k1Ci	Succulent steppe; saltbush	4347	14	0.33	14	0.33	g
254	e5,45Lr m6Sc	Shrublands; Melaleuca uncinata thicket with scattered wandoo (E. wandoo) and powderbark wandoo (E. astringens)	364	0	0.00	0	0.00	e

Table 2 continued

Veg Assoc	Beard Code	Description	Pre European Veg in Agric Zone	Extent IUCN	% IUCN	Extent CALM	% CALM	Codes*
308	a8Sp/k1,2Ci	Mosaic: Shrublands; A. sclerosperma sparse scrub / Succulent steppe; saltbush & bluebush	4335	0	0.00	1	0.02	f
325	k1,3Ci	Succulent steppe; saltbush & samphire	7495	0	0.00	0	0.00	e
351	e6,22Mr eaSi	Shrublands; mallee & acacia scrub with scattered York gum (E. loxophleba) & red mallee (E. oleosa group)	8487	0	0.00	0	0.00	e
352	e6Mi	Medium woodland; York gum (E. loxophleba)	691739	2278	0.33	2587	0.37	g
353	e6Mr eaSi	Shrublands; mallee & acacia scrub with scattered York gum (E. loxophleba)	78380	59	0.08	653	0.83	g
354	e6Mr a19,23Si	Shrublands; jam (A. acuminata) and A. rostellifera (+hakea?) scrub with scattered York gum (E. loxophleba)	82784	495	0.60	548	0.66	g
355	e6,22Lr a9,19Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & jam (A. acuminata) scrub with scattered York gum (E. loxophleba) & red mallee (E. oleosa group)	2674	0	0.00	0	0.00	e
356	eMr k1Ci	Succulent steppe with open woodland; eucalypts over saltbush	3332	135	4.06	135	4.06	g
358	a9,14Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & A. quadrimarginea on stony ridges	272	0	0.00	0	0.00	e
364	ceLr a9Si	Shrublands; bowgada (A. ramulosa-A.linophylla) scrub with scattered eucalypts & cypress pine (Callitris columellaris)	2405	0	0.00	0	0.00	e
365	e6,22Mr a9,19Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & jam (A. acuminata) scrub with scattered York gum (E. loxophleba) & red mallee (E. oleosa group)	5924	0	0.00	0	0.00	e
372	x3SZc/acSc	Mosaic: Shrublands; scrub-heath on deep sandy flats / Shrublands; thicket, acacia-casuarina alliance	60703	1583	2.61	2625	4.32	g
374	e6Lr a9Si	Shrublands; bowgada (A. ramulosa-A.linophylla) scrub with scattered York gum (E. loxophleba)	1989	0	0.00	2	0.08	f
379	x4SZc	Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region	277931	18723	6.74	18791	6.76	g
380	x3SZc	Shrublands; scrub-heath on sandplain	259132	11214	4.33	14323	5.53	g
385	e6Mr a9,19Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & jam (A. acuminata) scrub with scattered York gum (E. loxophleba)	17063	0	0.00	0	0.00	e
391	m6Sc	Shrublands; Melaeuca uncinata thicket	2446	415	16.97	415	16.97	
392	m5Sc	Shrublands; Melaeuca thyioides thicket	2233	113	5.04	113	5.04	g
404	a9,20Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & A. murrayana scrub	3397	0	0.00	0	0.00	e
405	a8,9,19Si	Shrublands; A. sclerosperma, bowgada (A. ramulosa-A.linophylla) & jam (A. acuminata) scrub	995	0	0.00	0	0.00	e
406	ace70b4xSc	Shrublands; acacia, casuarina, E. eudesmioides, Banksia ashbyi & other mixed species thicket	1461	0	0.00	0	0.00	e
407	c5Li a19Si	Low woodland over scrub; Allocasuarina heugeliana over jam (A. acuminata) scrub	240	0	0.00	0	0.00	e
408	x2SZc	Shrublands; scrub-heath on coastal association, yellow sandplain	101449	0	0.00	39	0.04	f
412	mSi k3Ci	Succulent steppe with scrub; teatree (Melaleuca thyioides?) over samphire	4381	0	0.00	0	0.00	e
413	a33Sc	Shrublands; A. neurophylla & A. species thicket	6835	17	0.24	17	0.24	g
419	a9,19m6Sc	Shrublands; bowgada (A. ramulosa-A.linophylla), jam (A. acuminata) and Melaleuca uncinata thicket	20493	0	0.00	0	0.00	e
420	a9,19Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & jam (A. acuminata) scrub	36435	352	0.97	352	0.97	g
427	c5e6Mr a19Si	Shrublands; jam (A. acuminata) scrub with scattered Allocasuarina heugelliana & York gum (E. loxophleba)	2815	0	0.00	0	0.00	e
435	a33,34,35Sc	Shrublands; A. neurophylla, A. beauverdiana & A. resinomarginea thicket	318086	7502	2.36	7589	2.39	g
437	anSc	Shrublands; Mixed acacia thicket on sandplain	43992	1231	2.80	1232	2.80	g
438	dSi	Shrublands; dodonaea scrub	332	0	0.00	0	0.00	e
482	e11,22Mi	Medium woodland; merrit (E. floctoniae) & red mallee (E. oleosa group)	205083	0	0.00	0	0.00	e
486	e8,22Mi/e15Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & red mallee (E. oleosa group) / Shrublands; mallee scrub	276636	81	0.03	1040	0.38	g

Table 2 continued

Veg Assoc	Beard Code	Description	Pre European Veg in Agric Zone	Extent IUCN	% IUCN	Extent CALM	% CALM	Codes*
		E. eremophila						
493	e8Mi/e11,22Mi	Medium woodland; salmon gum (E. salmonophloia) mixed with merrit (E. floctoniae) & red mallee (E. oleosa group)	5820	0	0.00	0	0.00	e
511	e8,9Mi	Medium woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis)	191354	16288	8.51	16288	8.51	g
512	e15,32Si	Shrublands; mallee scrub, E. eremophila & Forrest's marlock (E. forrestianna)	213340	881	0.41	4110	1.93	g
516	e27Si	Shrublands; mallee scrub, balck marlock (E. redunca)	831757	75505	9.08	79630	9.57	g
518	e11,12Mi/e15Si	Mosaic: Medium woodland; merrit (E. floctoniae) & coral gum (E. toquata) / Shrublands; mallee scrub E. eremophila	24739	0	0.00	0	0.00	e
519	e15Si	Shrublands; mallee scrub, E. eremophila	1355260	124918	9.22	126085	9.30	g
520	a14Sc	Shrublands; A. quadrimarginea thicket	135	0	0.00	0	0.00	e
521	e8,22Mi	Medium woodland; salmon gum (E. salmonophloia) & red mallee (E. oleosa group)	13684	0	0.00	0	0.00	e
522	e10,11Mi	Medium woodland; redwood (E. transcontinentalis) & merrit (E. floctoniae)	35319	0	0.00	0	0.00	e
524	e14,22Mi	Medium woodland; Dundas blackbutt (E. dundasii) & red mallee (E. oleosa group)	2186	0	0.00	0	0.00	e
536	e9,35Mi	Medium woodland; morrel (E. longicornis) & rough fruited mallee (E. corrugata)	13781	1374	9.97	1374	9.97	g
537	e9Mi	Medium woodland; morrel (E. longicornis)	437	0	0.00	0	0.00	e
538	a15Si	Shrublands; A. brachystachya scrub	6608	9	0.13	9	0.13	g
551	c3Sc	Shrublands; Allocasuarina campestris thicket	280702	2793	1.00	3112	1.11	g
552	c4Sc	Shrublands; Casuarina acutivalvus & calothamnus (also melalueca) thicket on greenstone hills	3167	0	0.00	212	6.69	f
631	e6Mi m5Sc k3Ci	Succulent steppe with woodland and thicket; York gum (E. loxophleba) over Melaleuca thyoides & samphire	89307	2249	2.52	2366	2.65	g
675	mhSc	Shrublands; mixed thicket (melaluca & hakea?)	1819	0	0.00	0	0.00	e
676	k3Ci	Succulent steppe; samphire	16522	493	2.99	493	2.99	g
684	e6Mr a19Si/c3Sc	Mosaic: Shrublands; Shrublands; jam (A. acuminata) scrub with scattered York gum (E. loxophleba) in the valleys / Allocasuarina campestris thicket	127189	250	0.20	321	0.25	g
686	e6,22Mi	Medium woodland; York gum (E. loxophleba) & red mallee (E. oleosa group)	5890	567	9.63	567	9.63	g
687	e6c5Mr a9,19Si	Shrublands; bowgada (A. ramulosa-A.linophylla) & jam (A. acuminata) scrub with scattered Allocasuarina heugelliana & York gum (E. loxophleba)	17062	0	0.00	0	0.00	f
691	edSc	Shrublands; Dryandra quercifolia & Eucalytpus spp. thicket	10101	0	0.00	0	0.00	e
692	cmSc	Shrublands; casuarina & melaleuca thicket	2918	0	0.00	63	2.17	f
693	c5Li eaSi/c3Sc	Mosaic: Low woodland: Allocasuarina heugeliana over mallee and acacia scrub / Allocasuarina campestris thicket	4377	0	0.00	0	0.00	e
694	x8SZc	Shrublands; scrub-heath on yellow sandplain banksia-xylomelum alliance in the Geraldton Sandplain & Avon-Wheatbelt Regions	348888	32570	9.34	32846	9.41	g
695	c3Si	Shrublands; Allocasuarina campestris scrub	667	0	0.00	0	0.00	e
696	e5,45Li cdSc	Shrublands; casuarina & dryandra thicket with wandoo (E. wandoo) and powderbark wandoo (E. astringens)	3089	254	8.23	317	10.27	g
697	x7SZc	Shrublands; scrub-heath on lateritic sandplain in the southern Geraldton Sandplain Region	74017	13086	17.68	13086	17.68	
698	x9SZc/e5,45Lp	Mosaic: Shrublands; scrub-heath Dryandra-Calothamnus assoc. with B. prionotes on limestone in the northern Swan Region / Sparse low woodland; wandoo (E. wandoo) & powderbark wandoo (E. wandoo)	11495	72	0.63	72	0.63	g
924	e15,22Si	Shrublands; mallee scrub, E. eremophila & red mallee (E. oleosa group)	81462	1009	1.24	1009	1.24	g
925	e22Si	Shrublands; mallee scrub, red mallee (E. oleosa group)	5159	0	0.00	0	0.00	e
929	e33Lc	Low forest; moort (E. platypus)	1689	4	0.23	134	7.93	g
931	e7Mi	Medium woodland; yate (E. occidentalis)	20473	1135	5.55	1311	6.40	g
934	e28Si	Shrublands; mallee scrub E. nutans	1455	68	4.69	170	11.70	g

Table 2 continued

Veg Assoc	Beard Code	Description	Pre European Veg in Agric Zone	Extent IUCN	% IUCN	Extent CALM	% CALM	Codes*
936	e8Mi	Medium woodland; salmon gum (E. salmonophloia)	76057	4827	6.35	4850	6.38	g'
938	e6,7Mi	Medium woodland; York gum (E. loxophleba) & yate (E. occidentalis)	70063	1036	1.48	1085	1.55	g
939	e6Mi mSp k3Ci	Succulent steppe with woodland; yorkgum, sparse teatree scrub & samphire	116	0	0.00	0	0.00	e
940	e27Si/e26SZc	Mosaic: Shrublands; mallee scrub, balck marlock (E. redunca) / Shrublands; tallerack (E. tetragona) mallee-heath	233298	49833	21.36	50098	21.47	
941	e8,9Mi/e10Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Shrublands; mallee scrub, redwood (E. transcontinentalis)	23560	3392	14.40	3392	14.40	g
942	e7Mi/e27Si	Mosaic: Medium woodland; yate (E. occidentalis) / Shrublands; mallee scrub, balck marlock (E. redunca)	33546	152	0.45	261	0.78	g
945	e8Mi/e10,27Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) / Shrublands; mallee scrub, redwood (E. transcontinentalis) & balck marlock (E. redunca) =131	176207	3869	2.20	3869	2.20	g
946	e5Mi	Medium woodland; wandoo (E. wandoo)	74318	3640	4.90	3640	4.90	g
947	e64,45Mi	Medium woodland; powderbark & mallet	31828	5341	16.78	5341	16.78	
948	e6,18Mr	Medium woodland; York gum (E. loxophleba) & river gum (E. rudis or E. camaldulensis)	1449	0	0.01	0	0.01	g
949	bLi	Low woodland; banksia	40241	287	0.71	2858	7.10	g
950	c6Mi	Medium woodland; Casuarina obesa	507	108	21.27	108	21.27	
951	e6,66Mp mSc k3Ci	Succulent steppe with sparse woodland & thicket; York gum (E. loxophleba) & Kondinin blackbutt over teatree thicket & samphire	27576	4475	16.23	4475	16.23	
952	dZc	Shrublands; dryandra heath	59368	3844	6.47	3844	6.47	g
953	mSc k3Ci	Succulent steppe with thicket; teatree over samphire (m5?)	10019	682	6.80	682	6.80	g
954	a19c5Si	Shrublands; thicket, jam (A. acuminata) & Allocasuarina huegeliana	5832	324	5.55	324	5.55	g
955	x10SZc/c3Sc	Mosaic: Shrublands; scrub-heath (SE Avon)/ Shrublands; Allocasuarina campestris thicket	138246	1061	0.77	1061	0.77	g
956	e5Mr c3Sc	Shrublands; Allocasuarina campestris thicket with scattered wandoo (E. wandoo)	25306	877	3.46	877	3.46	g
959	e36,66Mp mSc k3Ci	Succulent steppe with sparse woodland & thicket; yorrell (E.gracilis) & Kondinin blackbutt over teatree & samphire	13209	2761	20.91	2761	20.91	
960	e10,27Si	Shrublands; mallee scrub, redwood (E. transcontinentalis) & balck marlock (E. redunca)	159165	4325	2.72	4325	2.72	g
961	x10SZc/c4Sc	Mosaic: Shrublands; scrub-heath (SE Avon)/ Shrublands; Allocasuarina acutivalvis thicket	25002	2251	9.00	2251	9.00	g
962	e64Mi	Medium woodland; mallet (E. astringens)	1219	0	0.00	0	0.00	e
963	e7mMi	Medium woodland; yate (E. occidentalis) & paperbark (Melaleuca spp)	4086	431	10.54	431	10.54	g
965	e2,3Mi	Medium woodland; jarrah (E. marginata) & marri (E. calophylla)	2738	1026	37.48	1029	37.56	
966	e8,9Mp mSc k3Ci	Succulent steppe with sparse woodland & thicket; salmon gum (E. salmonophloia) & morrel (E. longicornis) over teatree & samphire	3231	0	0.00	0	0.00	e
967	e5,7Mi	Medium woodland; wandoo (E. wandoo) & yate (E. occidentalis)	189222	817	0.43	817	0.43	g
968	e2,3,5Mi	Medium woodland; jarrah (E. marginata), marri (E. calophylla) & wandoo (E. wandoo)	31302	8470	27.06	8470	27.06	
970	e2,67Lc	Low forest; jarrah (E. marginata) & E. decipiens	1393	1385	99.47	1385	99.47	
974	e6,8,9Mi	Medium woodland; York gum (E. loxophleba), salmon gum (E. salmonophloia) & morrel (E. longicornis)	7267	0	0.00	0	0.00	e
975	e2Li	Low woodland; jarrah (E. marginata)	9855	8838	89.68	8889	90.20	
976	mLi k3Ci	Succulent steppe with low woodland; myoporum over samphire	2172	455	20.92	455	20.92	
980	e2SZc	Shrublands; jarrah (E. marginata) mallee-heath	39749	39419	99.17	39419	99.17	
981	e5,6,7Mi	Medium woodland; wandoo (E. wandoo),York gum (E. loxophleba) & yate (E. occidentalis)	10591	0	0.00	0	0.00	e
982	e67Li	Low woodland; E. decipiens	902	559	62.00	559	62.00	

Table 2 continued

Veg Assoc	Beard Code	Description	Pre European Veg in Agric Zone	Extent IUCN	% IUCN	Extent CALM	% CALM	Codes*
986	enSZc	Shrublands; mallee-heath (Stirling Ra.)	28359	11524	40.64	12169	42.91	
987	e2,5Mi	Medium woodland; jarrah (E. marginata) & wandoo (E. wandoo)	791	722	91.34	722	91.34	
988	m5Sc k3Ci	Succulent steppe with thicket; Melaleuca thyoides over samphire	97429	2243	2.30	2243	2.30	g
991	e5Mi	Medium woodland; small wandoo (E. wandoo) patches surrounded by e2, 5Mi; e5, 7Mi	237	235	99.51	235	99.51	
992	e2,5Mc	Medium forest; jarrah (E. marginata) & wandoo (E. wandoo) (E. wandoo (E. wandoo))	20665	719	3.48	719	3.48	g
993	c5e6Mi	Medium woodland; York gum (E. loxophleba) & Allocasuarina huegeliana	2109	0	0.00	0	0.00	e
999	e3Mi	Medium woodland; marri (E. calophylla)	98429	0	0.00	86	0.09	f
1003	e2,3,5Mc	Medium forest; jarrah (E. marginata), marri (E. calophylla) & wandoo (E. wandoo)	11472	544	4.74	544	4.74	g
1004	e5Mr/xZc	Mosaic: Medium open woodland; wandoo (E. wandoo) / Shrublands; mixed heath	9251	7	0.08	7	0.08	g
1005	c5Li	Low woodland; Allocasuarina huegeliana	530	0	0.00	0	0.00	e
1006	e2,5,45Mi	Medium woodland; jarrah (E. marginata), wandoo (E. wandoo) & powderbark	1360	354	26.01	354	26.01	
1008	e3Mr	Medium open woodland; marri (E. calophylla)	1389	0	0.00	0	0.00	e
1014	bLi/mSc	Mosaic: Low woodland; banksia / Shrublands; teatree thicket	178	0	0.00	0	0.00	e
1015	x14SZc/dZc	Mosaic: Shrublands; scrub-heath on the Swan Coastal Plain / Shrublands; dryandra heath	19326	0	0.00	160	0.83	f
1016	bLi/dZc	Mosaic: Low woodland; banksia / Shrublands; dryandra heath	1455	0	0.00	0	0.00	e
1017	e2,3Mr bLi	Medium open woodland; jarrah (E. marginata) & marri (E. calophylla), with low woodland; banksia	5799	3	0.06	3	0.06	g
1018	e2,3Mi/bLi/mLc /c6Li	Mosaic: Medium forest; jarrah (E. marginata), marri (E. calophylla) / Low woodland; banksia / Low forest; teatree / Low woodland; Casuarina obesa	50	0	0.00	0	0.00	e
1019	e2,3Mp	Medium sparse woodland; jarrah (E. marginata) & marri (E. calophylla)	653	0	0.00	0	0.00	e
1020	e2,3Mc/e3,5Mi	Mosaic: Medium forest; jarrah (E. marginata), marri (E. calophylla) / Medium woodland; marri (E. calophylla)-wandoo (E. wandoo)	4937	17	0.35	96	1.95	g
1021	e5Mr/dZc	Mosaic: Medium open woodland; wandoo (E. wandoo) / Shrublands; dryandra heath	16	0	0.00	0	0.00	e
1022	c6Mi k3Ci	Succulent steppe with woodland; Casuarina obesa & samphire	460	0	0.00	0	0.00	e
1023	e5,6,8Mi	Medium woodland; York gum (E. loxophleba), wandoo (E. wandoo) & salmon gum (E. salmonophloia) (E. salmonophloia)	1351338	14799	1.10	14886	1.10	g
1024	ecSc	Shrublands; mallee & casuarina thicket	718571	4291	0.60	4291	0.60	g
1025	e6,8,9Mi/k1,3Ci	Mosaic: Medium woodland; York gum (E. loxophleba), salmon gum (E. salmonophloia) & morrel (E. longicornis) / Succulent steppe; saltbush & samphire	1942	0	0.00	0	0.00	e
1027	e2,3Mr bLi/e2,3,Mp	Mosaic: Medium open woodland; jarrah (E. marginata) & marri (E. calophylla), with low woodland; banksia / Medium sparse woodland; jarrah (E. marginata) & marri (E. calophylla)	39613	0	0.00	6834	17.25	g
1028	e18Mi	Medium woodland; river gum (E. rudis)	73	0	0.00	0	0.00	e
1030	b1,2Li	Low woodland; Banksia attenuata & B. menziesii	21647	0	0.00	96	0.44	g
1031	hSZc/dZc	Mosaic: Shrublands; hakea scrub-heath / Shrublands; dryandra heath	68084	5138	7.55	5138	7.55	g
1035	e3Mr/dZc	Mosaic: Medium open woodland; marri (E. calophylla) / Shrublands; dryandra heath	4189	0	0.00	0	0.01	f
1036	b3Li	Low woodland; Banksia prionotes	87256	13971	16.01	14328	16.42	
1037	e6,18Mi	Medium woodland; York gum (E. loxophleba) & river gum (E. rudis or E. camaldulensis)	2399	2284	95.22	2284	95.22	
1038	eMr b1,2Li	Medium open woodland; eucalypts, with low woodland; Banksia attenuata & B. menziesii	1729	0	0.00	0	0.00	e
1039	e6Mr eSi	Shrublands; mallee with scattered York gum (E. loxophleba)	2059	1083	52.62	1083	52.62	
1040	c6e6Mi	Medium woodland; York gum (E. loxophleba) & Casuarina obesa	2855	0	0.00	10	0.36	f
1041	c5a19Li	Low woodland; Allocasuarina huegeliana &	4809	253	5.26	253	5.26	g

Table 2 continued

Veg Assoc	Beard Code	Description	Pre European Veg in Agric Zone	Extent IUCN	% IUCN	Extent CALM	% CALM	Codes*
		jam (A. acuminata)						
1042	cLi k3Ci	Succulent steppe with low woodland; sheoak over samphire	272	0	0.00	0	0.00	e
1043	e5,45Mr/dZc	Mosaic: Medium open woodland; wandoo (E. wandoo) & powderbark wandoo (E. astringens) / Shrublands; dryandra heath	21	0	0.00	0	0.00	e
1044	e6,8Mi/m5Sc	Mosaic: Medium woodland; York gum (E. loxophleba) & salmon gum (E. salmonophloia) / Shrublands; Melaleuca thyioides thicket	1457	0	0.00	11	0.78	f
1046	e6Mi k3Ci	Succulent steppe with woodland; York gum (E. loxophleba) & samphire	783	0	0.00	0	0.00	e
1047	e29SZc	Shrublands; E. incrassata mallee-heath	16237	1	0.00	3	0.02	g
1048	mSp/k3Ci	Mosaic: Shrublands; melaleuca patchy scrub / Succulent steppe; samphire	11448	37	0.32	37	0.32	g
1049	e5,6,8,9,34Mi	Medium woodland; wandoo (E. wandoo), York gum (E. loxophleba), salmon gum (E. salmonophloia), morrel (E. longicornis) & gimlet (E. salubris)	649800	3038	0.47	3038	0.47	g
1051	e5,7Mr mSc	Shrublands; teatree thicket with scattered wandoo (E. wandoo) & yate (E. occidentalis)	12608	315	2.50	315	2.50	g
1053	e6Mr m6Sc	Shrublands; Melaleuca uncinata thicket with scattered York gum (E. loxophleba)	13903	999	7.18	999	7.18	g
1055	e6,39Si	Shrublands; York gum (E. loxophleba) & E. sheathiana mallee scrub	126695	1089	0.86	1089	0.86	g
1056	ac3Sc	Shrublands; thicket, acacia & Allocasuarina campestris	20951	691	3.30	691	3.30	g
1057	e8,34Mi/e6,39Si	Mosaic: Shrublands; Medium woodland; salmon gum (E. salmonophloia) & gimlet (E. salubris) / York gum (E. loxophleba) & E. sheathiana mallee scrub (some wandoo (E. wandoo) may occur with gimlet (E. salubris))	162952	3273	2.01	3273	2.01	g
1058	e6,19Si	Shrublands; York gum (E. loxophleba) & E. gonglocarpa mallee scrub	9385	0	0.00	0	0.00	e
1059	e8,34Mi/e9,39Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & gimlet (E. salubris) /Shrublands; mallee E. longicornis & E. sheathiana scrub	2265	0	0.00	0	0.00	e
1061	e8,36Mp/k1,3Ci	Mosaic: Medium sparse woodland; salmon gum (E. salmonophloia) & yorrell (E.gracilis) / Succulent steppe; saltbush & samphire	42869	5833	13.61	5833	13.61	g
1062	e6Mr m5Sc k3Ci	Succulent steppe with open woodland & thicket; York gum (E. loxophleba) over Melaleuca thyiodes & samphire	22598	2411	10.67	2411	10.67	g
1063	e6pMLi	Medium-Low woodland; York gum (E. loxophleba) & cypress pine (Callitris columellaris)	12028	0	0.00	0	0.00	e
1065	e5,34Mi/e6,39Si	Mosaic: Medium woodland; wnadoo (E. wandoo) & gimlet (E. salubris)/Shrublands; York gum (E. loxophleba) gimlet (E. salubris) mallee scrub	8334	331	3.97	331	3.97	g
1067	e8,9,34,35Mi	Medium woodland; salmon gum (E. salmonophloia), morrel (E. longicornis), gimlet (E. salubris) & rough fruited mallee (E. corrugata)	5947	0	0.00	0	0.00	e
1068	e8,9,34,39Mi	Medium woodland; salmon gum (E. salmonophloia), morrel (E. longicornis), gimlet (E. salubris) & E. sheathiana	159849	513	0.32	513	0.32	g
1071	aSi k1,2Ci	Succulent steppe with scrub; acacia species over saltbush & bluebush	67	0	0.00	0	0.00	e
1073	e5,64Mi	Medium woodland; wandoo (E. wandoo) & mallet	17007	3190	18.76	3190	18.76	
1074	e5c6Mr mSc k3Ci	Succulent steppe with open woodland & thicket; wandoo (E. wandoo) & Allocasuarina obesa over teatree & samphire	4626	2379	51.43	2379	51.43	
1075	e15,27Si	Shrublands; mallee scrub, E. eremophila & black marlock (E.redunca)	337619	4509	1.34	4762	1.41	g
1076	e8,9Mi/e15,24Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Shrublands; mallee scrub E. eremophila & ?bloodwood E. dichromophloia	11	11	99.54	11	99.54	
1077	e2,18Mi	Medium woodland; jarrah (E. marginata) & river gum (E. rudis)	2332	16	0.68	16	0.68	g
1079	e8,9Mr/k1Ci	Mosaic: Medium open woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Succulent steppe; saltbush	13526	3478	25.72	3478	25.72	
1080	eSr m6Sc (k3Ci)	Succulent steppe with malle & thickets; Mallee and Melaleuca uncinata thickets on salt flats	3908	0	0.00	0	0.00	e

Table 2 continued

Veg Assoc	Beard Code	Description	Pre European Veg in Agric Zone	Extent IUCN	% IUCN	Extent CALM	% CALM	Codes*
1081	e9,39Si	Shrublands; mallee scrub, E. longicornis & E. sheathiana	14	6	40.45	6	40.45	
1083	e5,8c6Mr mSi k3Ci	Succulent steppe with open woodland & scrub; wandoo (E. wandoo), salmon gum (E. salmonophloia) & Allocasuarina obesa over teatree & samphire	10738	963	8.97	963	8.97	g
1085	e5,69Mi	Medium woodland; wandoo (E. wandoo) & blue mallet (E. gardneri)	52126	33	0.06	33	0.06	g
1087	e5,9,69Mi	Medium woodland; wandoo (E. wandoo), morrel (E. longicornis) & blue mallet	750	68	9.10	68	9.10	g
1088	e64,69 Mi	Medium woodland; mallet & blue mallet	400	0	0.00	0	0.00	e
1091	b3c5Li	Low woodland; Banksia prionotes & Allocasuarina huegelianna	723	24	3.36	24	3.36	g
1092	e5,6,9 Mi	Medium woodland; wandoo (E. wandoo), York gum (E. loxophleba) & morrel (E. longicornis)	78484	292	0.37	292	0.37	g
1093	ec6Mr mSc k3Ci	Succulent steppe with open woodland & thicket; eucalypts & Allocasuarina obesa over teatree & samphire	8299	1034	12.46	1034	12.46	g
1094	e6,8Mi/e15,27Si	Mosaic: Medium woodland; York gum (E. loxophleba) & salmon gum (E. salmonophloia) / Shrublands; mallee scrub E. eremophila & balck marlock (E. redunca)	73112	58	0.08	58	0.08	g
1095	e6,7,8Mi	Medium woodland; York gum (E. loxophleba), yate (E. occidentalis) & salmon gum (E. salmonophloia)	1227	0	0.00	0	0.00	e
1096	e7,8Mi	Medium woodland; yate (E. occidentalis) & salmon gum (E. salmonophloia)	354	0	0.00	0	0.00	e
1098	e8,9Mp/k3Ci	Mosaic: Medium sparse woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Succulent steppe; samphire	18236	2836	15.55	2836	15.55	
1111	e37Mi	Medium woodland; yate (E. occidentalis)	162	48	29.45	48	29.45	
1134	e2Mi	Medium woodland; jarrah (E. marginata) (south coast)	5562	1437	25.83	1726	31.04	
1143	c3Sc xZi	Shrublands; Allocasuarina campestris thicket with patches of heath	66231	0	0.00	120	0.18	f
1147	x10SZc	Shrublands; scrub-heath in the south-east Avon-Wheatbelt Region	43704	144	0.33	144	0.33	g
1148	x12SZc	Shrublands; scrub-heath in the Coolgardie Region	7557	0	0.00	0	0.00	e
1149	x19SZc	Shrublands; scrub-heath A.-Ecdeiocolia association in the south-east Geraldton Sandplain Region	7576	182	2.41	211	2.78	g
1154	anSc xZi	Shrublands; A. thicket with patches of heath	39478	173	0.44	226	0.57	g
1155	e6Mi/c3Sc	Mosaic: Medium woodland; York gum (E. loxophleba) / Shrublands; Allocasuarina campestris thicket	7871	0	0.00	0	0.00	e
1156	a19c5Lr cSc	Shrublands; Allocasuarina campestris thickets with scattered jam (A. acuminata) & casuarina	1749	0	0.00	0	0.00	e
1164	x8SZc/c3Sc	Mosaic: Shrublands; scrub-heath on sandplain (banksia-xylomelum alliance) in the Geraldton Sandplain & Avon-Wheatbelt Regions / Shrublands; Allocasuarina campestris thicket	2024	0	0.00	0	0.00	e
1198	m5Si k3Ci/a9Sr	Mosaic: Succulent steppe with thicket; Melaleuca thyiodes over samphire / Shrublands; bowgada (A. ramulosa-A.linophylla) open scrub	1483	0	0.00	0	0.00	e
1200	e8,9Mi/e15,27Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Shrublands; mallee scrub E. eremophila & black marlock (E. redunca)	125024	1582	1.27	1582	1.27	g
1271	clay	Bare and poorly vegetated areas; claypans, =125	629	190	30.26	190	30.26	
1413	acmSc	Shrublands; acacia, casuarina & melaleuca thicket	831228	14577	1.75	14782	1.78	g
1516	e27,32Si	Shrublands; mallee scrub, balck marlock (E. redunca) & Forrest's marlock (E. forrestiana)	109838	2184	1.99	13519	12.31	g
1519	e15,bSi	Shrublands; mallee scrub, E. eremophila & banksia	3297	0	0.00	0	0.00	e
1967	e5,7,18Mi	Medium woodland; wandoo (E. wandoo), yate (E. occidentalis) & river gum (E. rudis or E. camaldulensis)	25734	330	1.28	362	1.41	g
2047	c3dSc	Shrublands; tamma & dryandra thicket	1454	579	39.84	579	39.84	
2048	x13SZc	Shrublands; scrub-heath in the Mallee Region	216052	15239	7.05	15239	7.05	g
2081	a9Si	Shrublands; bowgada (A. ramulosa-A.linophylla) and associated spp. scrub	860	0	0.00	0	0.00	e

Table 2 continued

Veg Assoc	Beard Code	Description	Pre European Veg in Agric Zone	Extent IUCN	% IUCN	Extent CALM	% CALM	Codes*
2093	e7Mi mSi k3Ci	Succulent steppe with open woodland & scrub; yate (E. occidentalis) over teatree & samphire	9296	2693	28.97	2693	28.97	
3041	a19c5Li/rock	Mosaic: Low woodland; Allocasuarina huegeliana & jam (A. acuminata) around granite rocks	6056	95	1.56	95	1.56	g
4048	x15SZc	Shrublands; scrub-heath in the Esperence Plains incl. Mt Ragged scrub-heath	3945	92	2.34	92	2.34	g
5048	blSZc	Shrublands; banksia and lambertia scrub-heath in the Esperence Plains Region	5097	0	0.00	359	7.04	f
6048	bSZc	Shrublands; banksia scrub-heath on sandplain in the Esperence Plains Region	2693	0	0.00	118	4.40	f

*codes are e = vegetation associations completely unrepresented in reserves in IUCN categories I- IV or in other CALM-managed lands, f = vegetation association unrepresented in reserves in IUCN categories I- IV reserves but <15% of their original areal extent in other CALM-managed lands, g = inadequately represented in the conservation reserve system with <15% of their original areal extent in reserves in IUCN categories I- IV.

Table 3 lists those vegetation associations that may be regarded as at risk from rising ground waters and associated salinisation. Eighteen vegetation associations have 100% of their present extent in areas of soils at risk from salinity. A further 18 associations have >70% of their present extent in areas of soils at risk from salinity. Nine associations have >50% of their present extent in areas of soils at risk from salinity. The total number of vegetation types at risk (out of the 183 analysed) is 45. These vegetation associations at risk are coded h, i & j.

Table 3. Vegetation associations potentially at risk from rising groundwater and salinisation. Codes are h = vegetation association with 100% of its remaining extent at risk, i= vegetation association with >70% or its remaining extent at risk, j = vegetation association with >50% or its remaining extent at risk.

Veg Assoc	Beard Code	Description	% Existing veg that is at risk	Code *
9	e12,13Mi	Medium woodland; coral gum (E. toquata) & goldfields blackbutt (E. le soufii) (also some redwood (E. transcontinentalis) & merrit (E. floctoniae))	100.00	h
10	e22Mi	Medium woodland; red mallee (E. oleosa group) group	100.00	h
31	e6Mr m5Sc	Shrublands; Melaleuca thyoides thicket with scattered York gum (E. loxophleba)	71.24	i
37	mSc	Shrublands; teatree thicket	58.32	j
41	mSi	Shrublands; teatree scrub	93.79	i
125	sl	Bare and poorly vegetated areas; salt lakes, lagoons &claypans	62.40	j
129	ds	Bare and poorly vegetated areas; sand	100.00	h
412	mSi k3Ci	Succulent steppe with scrub; teatree (Melaleuca thyioides?) over samphire	64.87	j
482	e11,22Mi	Medium woodland; merrit (E. floctoniae) & red mallee (E. oleosa group)	100.00	h
486	e8,22Mi/e15Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & red mallee (E. oleosa group) / Shrublands; mallee scrub E. eremophila	100.00	h
511	e8,9Mi	Medium woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis)	60.41	j
512	e15,32Si	Shrublands; mallee scrub, E. eremophila & Forrest's marlock (E. forrestianna)	100.00	h
552	c4Sc	Shrublands; Casuarina acutivalvus & calothamnus (also melalueca) thicket on greenstone hills	84.19	i
695	c3Si	Shrublands; Allocasuarina campestris scrub	100.00	h
697	x7SZc	Shrublands; scrub-heath on lateritic sandplain in the southern Geraldton Sandplain Region	93.86	i
924	e15,22Si	Shrublands; mallee scrub, E. eremophila & red mallee (E. oleosa group)	100.00	h
925	e22Si	Shrublands; mallee scrub, red mallee (E. oleosa group)	100.00	h
929	e33Lc	Low forest; moort (E. platypus)	52.95	j
948	e6,18Mr	Medium woodland; York gum (E. loxophleba) & river gum (E. rudis or E. camaldulensis)	100.00	h
950	c6Mi	Medium woodland; Casuarina obesa	98.16	i
953	mSc k3Ci	Succulent steppe with thicket; teatree over samphire (m5?)	88.56	i
963	e7mMi	Medium woodland; yate (E. occidentalis) & paperbark (Melaleuca spp)	93.56	i
966	e8,9Mp mSc k3Ci	Succulent steppe with sparse woodland & thicket; salmon gum (E. salmonophloia) & morrel (E. longicornis) over teatree & samphire	100.00	h
988	m5Sc k3Ci	Succulent steppe with thicket; Melaleuca thyoides over samphire	69.86	j
1036	b3Li	Low woodland; Banksia prionotes	73.34	i
1037	e6,18Mi	Medium woodland; York gum (E. loxophleba) & river gum (E. rudis or E. camaldulensis)	99.86	i
1039	e6Mr eSi	Shrublands; mallee with scattered York gum (E. loxophleba)	100.00	h
1040	c6e6Mi	Medium woodland; York gum (E. loxophleba) & Casuarina obesa	91.25	i
1047	e29SZc	Shrublands; E. incrassata mallee-heath	100.00	h
1051	e5,7Mr mSc	Shrublands; teatree thicket with scattered wandoo (E. wandoo) & yate (E. occidentalis)	88.47	i
1053	e6Mr m6Sc	Shrublands; Melaleuca uncinata thicket with scattered York gum (E. loxophleba)	50.51	j
1074	e5c6Mr mSc k3Ci	Succulent steppe with open woodland & thicket; wandoo (E. wandoo) & Allocasuarina obesa over teatree & samphire	95.28	i
1079	e8,9Mr/k1Ci	Mosaic: Medium open woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Succulent steppe; saltbush	98.71	i
1083	e5,8c6Mr mSi k3Ci	Succulent steppe with open woodland & scrub; wandoo (E. wandoo), salmon gum (E. salmonophloia) & Allocasuarina obesa over teatree & samphire	81.94	i
1091	b3c5Li	Low woodland; Banksia prionotes & Allocasuarina huegelianna	100.00	h
1093	ec6Mr mSc k3Ci	Succulent steppe with open woodland & thicket; eucalypts & Allocasuarina obesa over teatree & samphire	89.89	i
1096	e7,8Mi	Medium woodland; yate (E. occidentalis) & salmon gum (E. salmonophloia)	97.78	i
1098	e8,9Mp/k3Ci	Mosaic: Medium sparse woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Succulent steppe; samphire	94.88	i

Table 3 continued

1164	x8SZc/c3Sc	Mosaic: Shrublands; scrub-heath on sandplain (banksia-xylomelum alliance) in the Geraldton Sandplain & Avon-Wheatbelt Regions / Shrublands; Allocasuarina campestris thicket	50.00	j
1200	e8,9Mi/e15,27Si	Mosaic: Medium woodland; salmon gum (E. salmonophloia) & morrel (E. longicornis) / Shrublands; mallee scrub E. eremophila & black marlock (E. redunca)	55.52	j
1516	e27,32Si	Shrublands; mallee scrub, balck marlock (E. redunca) & Forrest's marlock (E. forrestiana)	100.00	h
2093	e7Mi mSi k3Ci	Succulent steppe with open woodland & scrub; yate (E. occidentalis) over teatree & samphire	95.59	i
4048	x15SZc	Shrublands; scrub-heath in the Esperence Plains incl. Mt Ragged scrub-heath	100.00	h
5048	blSZc	Shrublands; banksia and lambertia scrub-heath in the Esperence Plains Region	100.00	h
6048	bSZc	Shrublands; banksia scrub-heath on sandplain in the Esperence Plains Region	100.00	h

*codes are h = vegetation association with 100% of its remaining extent at risk, i = vegetation association with >70% of its remaining extent at risk, j = vegetation association with >50% or its remaining extent at risk.

Table 4 represents a distillation of the data in Tables 1, 2, 3. The table shows those vegetation associations that show all of the following characteristics:

- extensively cleared with less that 10% of their original areal extent remaining, or relatively restricted in distribution occurring over less than 2,000 ha, or both;
- completely unrepresented in the conservation reserve system or on other lands managed by CALM, and therefore a priority for acquisition;
- greatly at risk from rising groundwater and salinisation.

Five vegetation associations are identified. These vegetation associations should be given high priority for field survey leading to improved conservation and management. Figures 2-6 show the general location and distribution of these priority associations.

Table 4. Summary of analyses showing the vegetation associations that are relatively restricted in areal extent, poorly conserved and at risk

Veg Assoc	Beard Code	Description	Limited present extent	At risk	Poorly conserved
695	c3Si	Shrublands; Allocasuarina campestris scrub	ac	h	e
966	e8,9Mp mSc k3Ci	Succulent steppe with sparse woodland & thicket; salmon gum (E. salmonophloia) & morrel (E. longicornis) over teatree & samphire	ac	h	e
1096	e7,8Mi	Medium woodland; yate (E. occidentalis) & salmon gum (E. salmonophloia)	c	i	e
412	mSi k3Ci	Succulent steppe with scrub; teatree (Melaleuca thyioides?) over samphire	ac	j	e
1164	x8SZc/c3Sc	Mosaic: Shrublands; scrub-heath on sandplain (banksia-xylomelum alliance) in the Geraldton Sandplain & Avon-Wheatbelt Regions / Shrublands; Allocasuarina campestris thicket	ac	j	e

*codes are a = vegetation association with <10% of its original areal extent remaining, b = vegetation association with <30% of its original areal extent remaining, c = vegetation association with <2,000 ha remaining in the SOUTH West Agricultural Region and < 50,000 ha remaining in total, e = vegetation association completely unrepresented in reserves in IUCN categories I- IV or in other CALM-managed lands, f = vegetation association unrepresented in reserves in IUCN categories I- IV but <15% of their original areal extent in other CALM-managed lands, g = inadequately represented in the conservation reserve system with <15% of their original areal extent in reserves in IUCN categories I- IV, h = vegetation association with 100% of its present extent at risk, i = vegetation association with >70% of its present extent at risk, j = vegetation association with >50% of its present extent at risk.

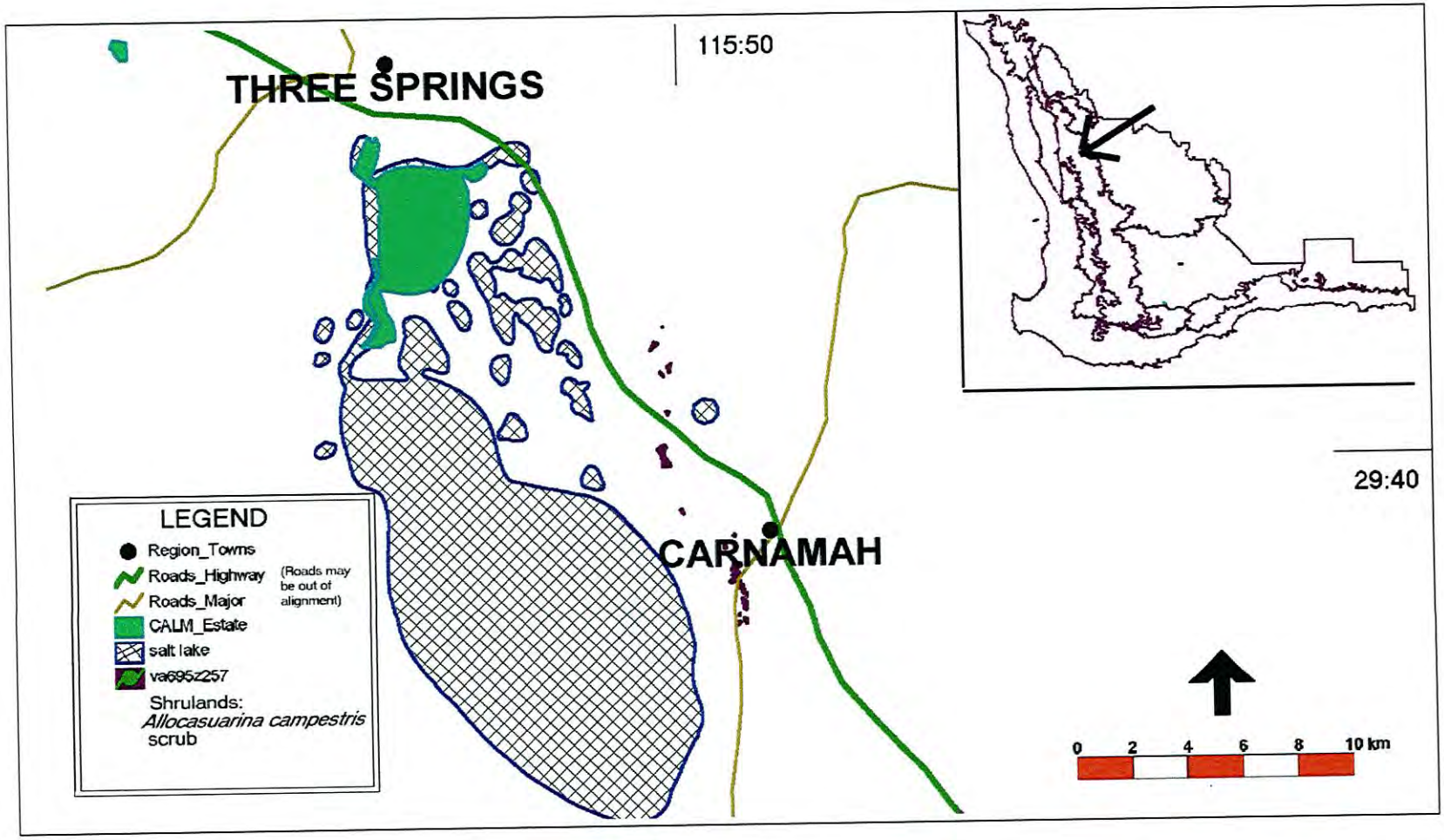

Figure 2. Map showing the present extent of Vegetation Association No 695, c_3Si , Shrublands; *Allocasuarina campestris* scrub, a poorly reserved and potentially threatened vegetation type

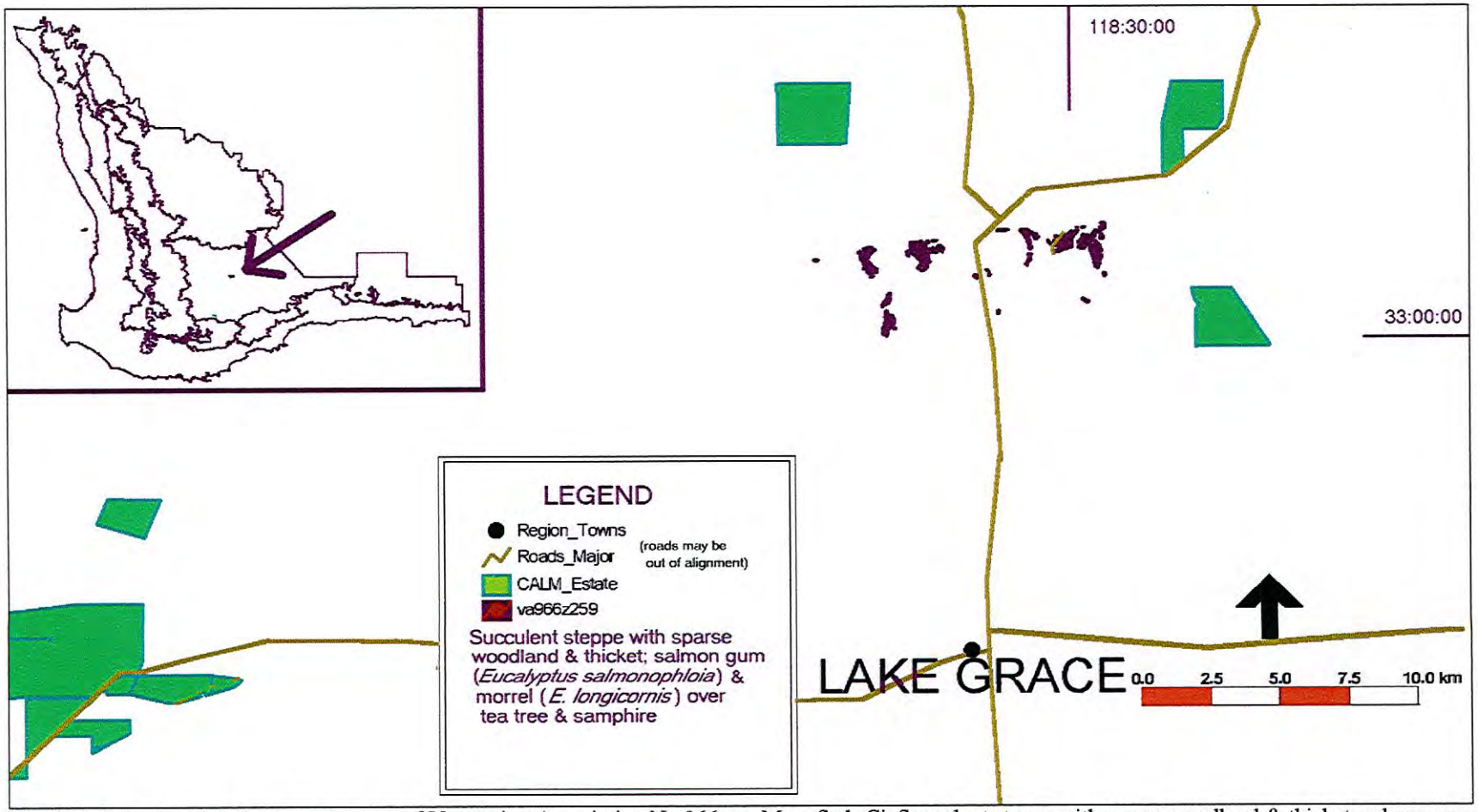

Figure 3. Map showing the present extent of Vegetation Association No 966, $e_{8,9}$Mp mSc k_3Ci, Succulent steppe with sparse woodland & thicket; salmon gum (*Eucalyptus salmonophloia*) & morrel (*E. longicornis*) over teatree & samphire, a poorly reserved and potentially threatened vegetation type

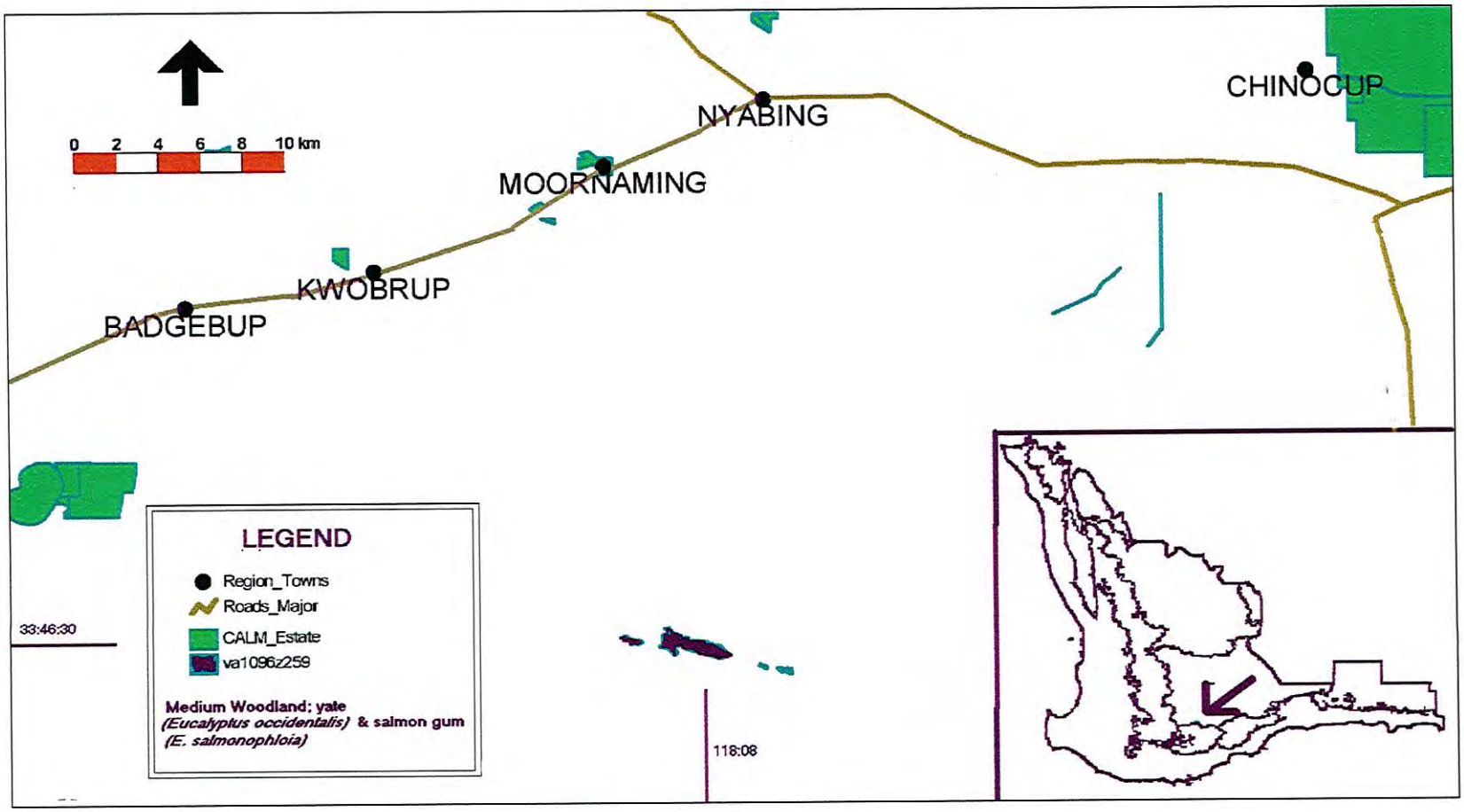

Figure 4. Map showing the present extent of Vegetatioin Association No 1096, $e_{7,8}$Mi, Medium woodland; yate (*Eucalyptus occidentalis*) & salmon gum (*E. salmonophloia*), a poorly reserved and potentially threatened vegetation type

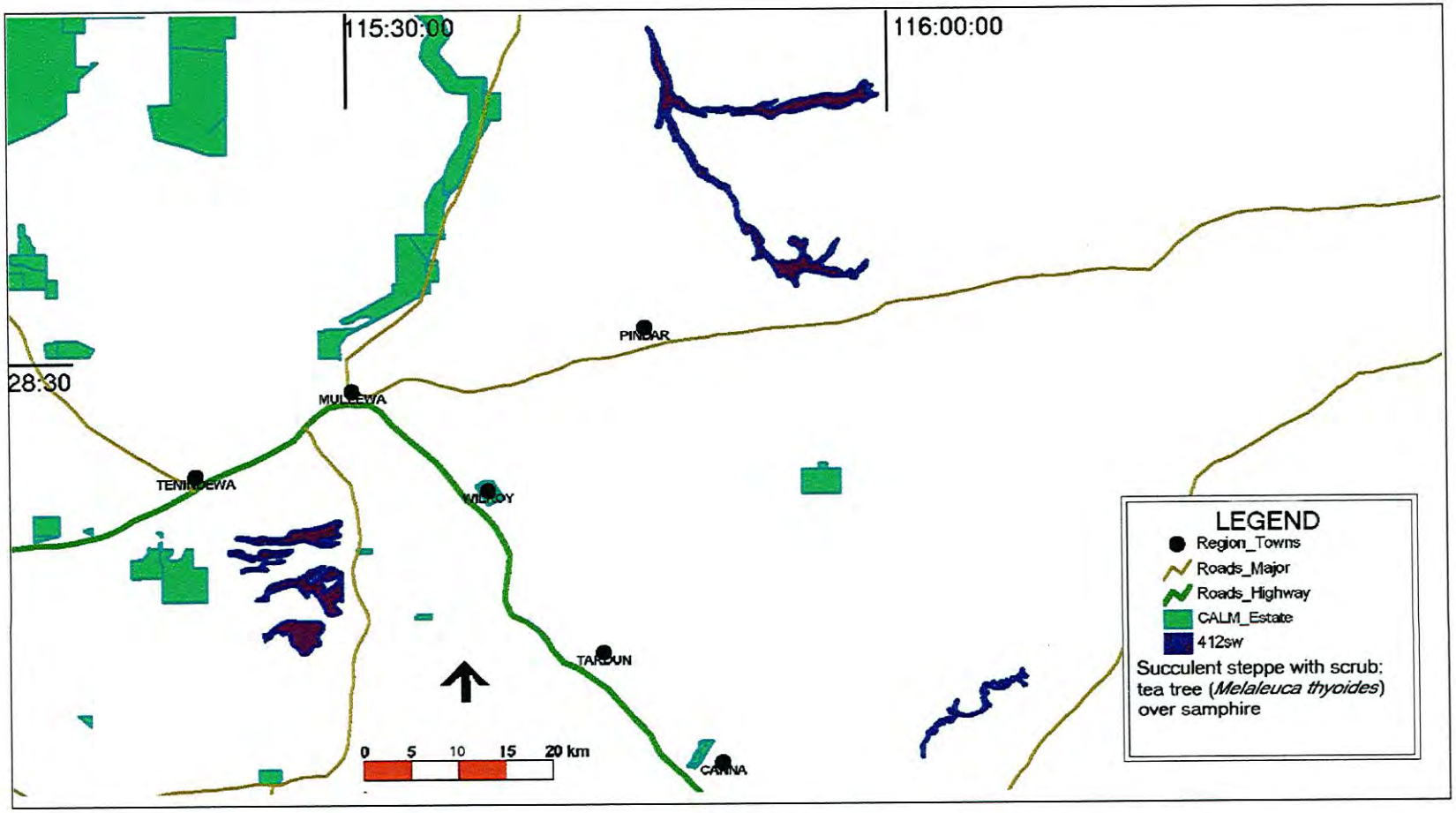

Figure 5. Map showing the present extent of Vegetation Association No 412, mSi k_3Ci, Succulent steppe with scrub; teatree (*Melaleuca thyioides*?) over samphire, a poorly reserved and potentially threatened vegetation type

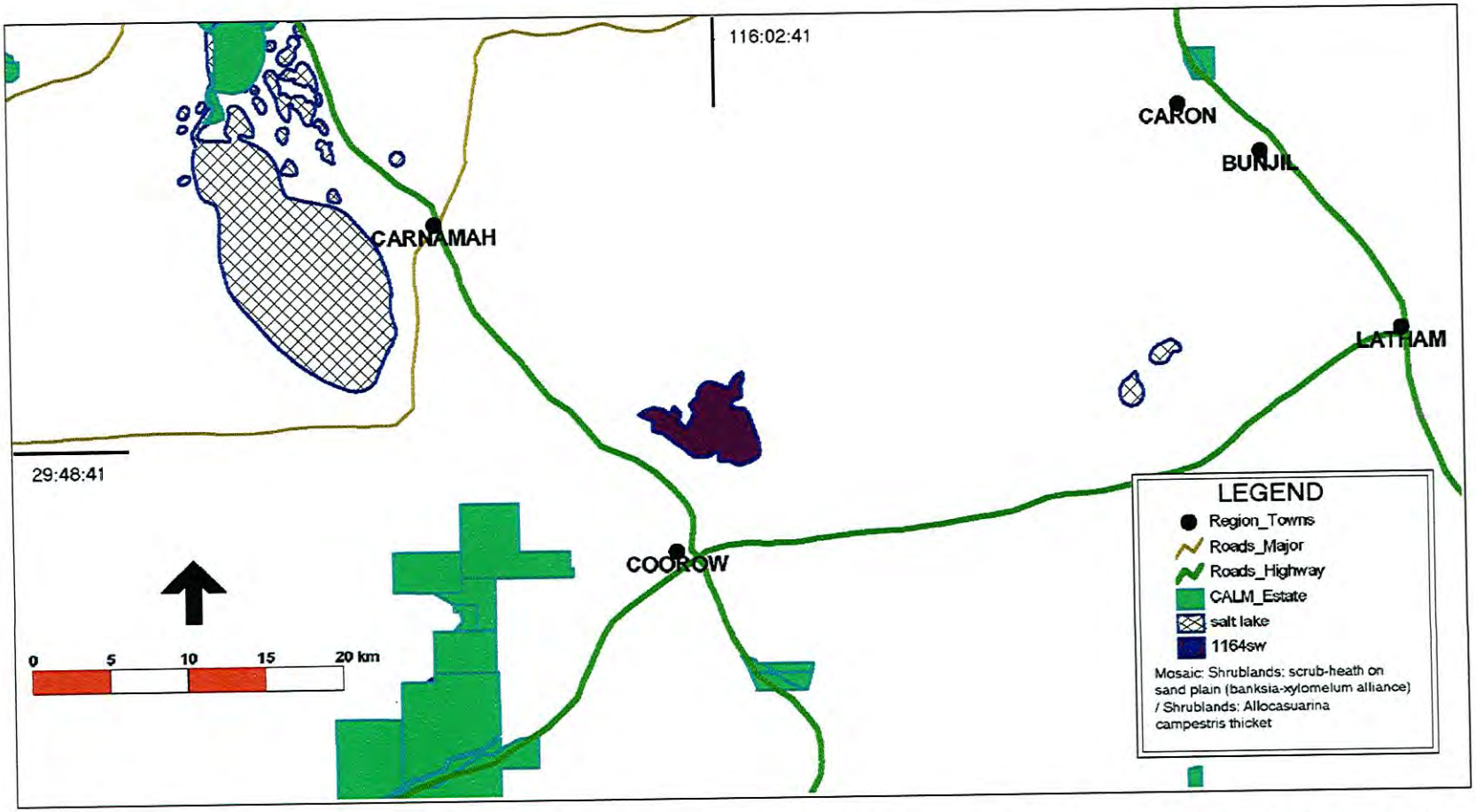

Figure 6. Map showing the present extent of Vegetation Association No 1164, x_8SZc/c_3Sc, Mosaic: Shrublands; scrub-heath on sandplain (banksia-xylomelum alliance) in the Geraldton Sandplain & Avon-Wheatbelt Regions / Shrublands; *Allocasuarina campestris* thicket , a poorly reserved and potentially threatened vegetation type

CONCLUSIONS

This report gives the results of a preliminary assessment of conservation status and threat of association-level vegetation units in the Western Australian wheatbelt. Data on some 236 vegetation associations are provided. Of these associations, more than half are at risk from land clearing and associated fragmentation (EPA 1999). Almost all (207 of the 236) are under-represented in the conservation reserve system: 97 are not represented at all. And 44 associations are potentially at risk from rising groundwater and associated salinisation.

Five vegetation associations have a combination of high priority or risk characteristics for all three attributes studied here: they are extensively cleared, associated with saline soils so potentially at risk, and poorly represented in the present conservation reserve system. These five associations should be given highest priority for further research. Since the project is a desk-top one, such research should begin with on-ground survey.

The data are amenable to reanalysis to identify other priority vegetation associations eg those that are at less risk. Tables are available in digital form on request.

The five high priority vegetation associations listed in Table 4 should be evaluated against criteria for Threatened Ecological Communities (Blyth and English 1999). Other, lower-priority associations could be considered for entry in the TECs database in a lower risk category.

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