

CONTENTS

7.	YARRAWONGA LANDSCAPE ZONE	2
7.1	Yarrowonga Landscape Zone description	3
7.2	Yarrowonga Landscape Zone priorities	9
7.3	Private Land.....	10
7.4	Public Land Water Frontage	14
7.5	Water Production	16
7.6	State Forest	18
7.7	Other State Government.....	21
7.8	Local Government	24
7.9	Parks and Reserves	28

LIST OF TABLES

Table 18.	Total area of pre-1750 and extant EVCs in the Yarrowonga Landscape Zone	6
Table 19.	Total area and number of current EVCs in each conservation status in the Yarrowonga Landscape Zone	6
Table 20.	List of current threatened flora and their conservation status in the Yarrowonga Landscape Zone (NRE 2002c).	7
Table 21.	List of current threatened fauna and their conservation status in the Yarrowonga Landscape Zone (NRE 2002d)	8

7. Yarrawonga Landscape Zone

7. Yarrowonga Landscape Zone

7.1 Yarrowonga Landscape Zone description

Yarrowonga Landscape Zone (111,839 ha, 27% of the plan area) is bounded to the north by the Murray River, to the south by the Murray Fans bioregional boundary and to the west by the Waaia–Bearii Road and its imaginary extension north to the Murray River. Bundalong (south of Lake Mulwala) is at the eastern extremity of the zone. Main towns are Strathmerton, Cobram and Yarrowonga, with Katamatite lying just outside the southern margin. The zone is traversed by the Numurkah–Cobram railway, which also branches towards Tocumwal from Strathmerton. The Murray Valley and Goulburn Valley Highways are major regional arteries traversing the zone, which lies entirely within the Local Government Area of Moira and the Goulburn Broken CMA (Map 11).

The entire zone lies within the Broken River Basin (LCC 1989). Being on a large, relatively flat plain, the zone is serviced by an extensive network of artificial drains and irrigation channels. Irrigation water for most of the zone is delivered via the Yarrowonga Channel, from Yarrowonga Weir, whilst numerous local drains carry outflows back to the Murray River. Between Koonoomoo and Bearii districts, the Ulupna–Sheepwash Creek system occurs as an east-west anabranch of the Murray River, forming Ulupna Island. A natural east-west drainage line—the Muckatah Depression—exists across the south of the zone, running largely through freehold from south-east of Yarrowonga nearly to Numurkah, where it drains into Broken Creek.

Only Murray Fans bioregion is represented within this zone, which is comprised of two main land systems—floodplain and riverine plain. Both land systems consist of quaternary alluvial sediments, but with the floodplain deposits being more recent (LCC 1983).

Within the zone, the location of floodplain landform is approximated by the distribution of frequently-inundated River Red Gum forests along the Murray River. This floodplain system includes ox-bows, meander scrolls and occasional source bordering dunes. Due to periodic flooding and heavy soils, the floodplain is unsuitable for general farming purposes and supports mostly reserved forest.



River Red Gum and volunteer grasses lining Public Land Water Frontage adjacent to dryland farmland on the riverine plain near Bearii. Nature Scope Pty. Ltd.

That part of Top Island lying within the zone and a linked part of Ulupna Island, are part of Barmah State Park (A2) (LCC 1985). The remaining floodplain forest exists as a strip of State Forest (F1) and River Murray Reserve (E1), of varying width and punctuated by segments of Regional Park (Tocumwal A6, Cobram A7, Yarrowonga A8) and Wildlife Reserve (Big Reedy Lagoon C30), bordering the Murray River from Ulupna to Yarrowonga. The riparian forest resource has significance for hardwood timber and honey production, as well as for recreation and nature conservation (Map 12).

7. Yarrowonga Landscape Zone

7.1 Yarrowonga Landscape Zone description (cont'd)

The riverine plain, occupying most of the zone, is characteristically well-drained, with leveed prior streams and wind-blown sand dunes.

Pre-1750 vegetation on the floodplain land system consisted of River Red Gum-dominated *riverine grassy woodland* / *riverine sedgy forest* / *wetland mosaic* (d), flanked in places by patches of *sand ridge woodland* (e). While the latter EVC has now vanished, the former mosaic still persists, though to a more restricted extent, close along the Murray River (Map 23).

Parts of the adjacent riverine plain (Yielima, Bearii and Mywee districts) now used for dryland farming typically supported *riverine grassy woodland* (v), *black box chenopod woodland* (e) or *riverine grassy woodland* / *riverina plains grassy woodland* / *black box chenopod woodland complex* (e) (Map 25, 25). Only small patches (seldom as large as 5 ha) of pre-1750 woodland types remain in the dryland farming districts and even fewer survive in



Wide (60 m) road reserve at Koonoomoo, supporting remnant Yellow Box and River Red Gum, but with a disturbed understorey of volunteer grasses and invaded with Pepper-tree and Olive from surrounding lands. Nature Scope Pty. Ltd.

the irrigation farming districts. The exceptions, throughout the riverine plain, are on roadsides, some of which (notably Koonoomoo–Cobram Road and Murray Valley Highway) retain good linear examples of former vegetation types, especially where road reserves are two chains (40 m) or even three chains (60 m) wide.

Other more southerly parts of the riverine plain now supporting extensive irrigated farming formerly carried *plains grassy woodland* (e), *riverine grassy woodland* / *black box chenopod woodland* / *wetland mosaic* (e), or *pine box woodland* / *riverina plains grassy woodland mosaic* (e). The Muckatah Depression originally constituted a single continuous long narrow wetland, largely on freehold. However, this wetland has been extensively modified by private landholders through clearing, grazing, cropping and irrigation. Nevertheless, the depression retains high ecological values, with numerous sedge- and herb-dominated freshwater meadows, often with associated River Red Gum and, sometimes, Grey Box overstorey and supporting a number of significant threatened flora and fauna taxa (EA 2001).

The main use of the floodplain system today is for recreation, nature conservation and limited hardwood timber production. Timber production is permitted within State Forest (proposed SMZ 117/01) along the Murray River and within specified parts of Barmah State Park (A2), within the zone. Also (as in Barmah zone), cattle grazing under licence or agistment is permitted in parts of Barmah State Park, the Regional Parks, River Murray Reserve and State Forest within the zone, where this does not conflict with primary management goals (LCC 1983, DCE 1992, NRE 2002e). There are no biodiversity benefits arising from this ongoing use, while a range of adverse environmental effects have been documented (NRE 2002e).

7. Yarrowonga Landscape Zone

7.1 Yarrowonga Landscape Zone description (cont'd)

Dryland farming (mixed cropping and grazing) occurs on the riverine plain abutting the floodplain, whilst irrigated farming across the more southerly parts of the riverine plain includes orchards, as well as dairying and mixed farming (LCC 1983). The district produces such diverse outputs as citrus fruits, olives, vegetables, wheat, oats, barley, sunflower, wool and beef.

Detailed maps showing the locations of Pre-1750 EVCs (Map 23), Current EVCs (Map 24), EVC conservation status and public land (Map 25), threatened fauna (Map 26), threatened flora (Map 27) and 1A threatened species and management actions (Map 28) are at the end of this document.

For Threatened Biodiversity Assets, the codes used in brackets are:

- Conservation status (Australia - upper case, Victoria - lower case); followed by
- BNA priority / risk rankings for threatened taxa (1A, 2A, 2B, etc., or un – unranked).



A wetland on Cassidy Road, Muckatah, in the south of the zone, with dead trees reflecting altered water regimes or salinity levels and with an invasion of weeds and pasture grasses, particularly canary-grass. Nature Scope Pty. Ltd.

7. Yarrowonga Landscape Zone

7.1 Yarrowonga Landscape Zone description (cont'd)

Table 18. Total area of pre-1750 and extant EVCs in the Yarrowonga Landscape Zone

EVC Group	EVC Number	EVC Bioregional Conservation Status	EVC Name	Pre-1750 Area (ha)	Current Area (ha)
15	68	E	Creekline Grassy Woodland	<1	<1
14	55	E	Plains Grassy Woodland	45464	264
14	867	E	Pine Box Woodland/Riverina Plains Grassy Woodland Mosaic	26846	233
15	295	D	Riverine Grassy Woodland	10710	409
15	255	D	Riverine Grassy Woodland/Riverine Sedgy Forest/Wetland Mosaic	9510	5223
15	873	V	Riverine Grassy Woodland/Black Box Chenopod Woodland/Wetland Mosaic	4355	46
15	872	E	Riverine Grassy Woodland/Riverina Plains Grassy Woodland/Black Box Chenopod Woodland Complex	3599	15
14	868	E	Pine Box Woodland	2109	51
14	264	E	Sand Ridge Woodland	2048	24
15	168	E	Drainage Line Complex	1813	115
19	74	E	Wetland Formation	1499	33
15	870	E	Riverine Grassy Woodland/Riverina Plains Grassy Woodland Complex	1410	32
15	103	E	Black Box Chenopod Woodland	572	2
19	292	E	Red Gum Wetland	408	6
19	333	E	Red Gum Wetland/Plains Grassy Wetland Mosaic	386	63
14	294	E	Plains Grassy Woodland/Gilgai Plains Woodland/Wetland Mosaic	235	<1
5	175	E	Grassy Woodland	198	1
19	334	E	Lagoon Wetland	174	28
19	125	E	Plains Grassy Wetland	164	0
19	297	E	Lagoon Wetland/Red Gum Wetland Mosaic	32	0
TOTAL				111534	6543
99	997	NA	Private Land No Tree Cover	0	104991
99	999	NA	Unknown/Unclassified	257	256

Table 19. Total area and number of current EVCs in each conservation status in the Yarrowonga Landscape Zone

EVC Bioregional Conservation Status	Hectares	Number of EVCs
Endangered	865	15
Vulnerable	46	1
Depleted	5632	2
Least Concern	0	0
Presumed Extinct	0	0

7. Yarrowonga Landscape Zone

7.1 Yarrowonga Landscape Zone description (cont'd)

Table 20. List of current threatened flora and their conservation status in the Yarrowonga Landscape Zone (NRE 2002c).

Latin Name	English Name	Australian Status	Victorian Status	FFG Listed	FFG Action Statement Number	Recovery Plan	BNA Unassessed	Species number
<i>Acacia melvillei</i>	Myall		v				Un	58
<i>Acacia omalophylla</i>	Yarran Wattle		e	L				69
<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass	V	k					3623
<i>Aristida calycina</i> var. <i>calycina</i>	Dark Wire-grass		r				Un	3630
<i>Austrostipa setacea</i>	Corkscrew Spear-grass		r				Un	3292
<i>Brachyscome chrysoglossa</i>	Yellow-tongue Daisy		v	L				3654
<i>Brachyscome muelleroides</i>	Mueller Daisy	V	e	L				465
<i>Brachyscome readeri</i>	Reader's Daisy		r				Un	474
<i>Callitriche umbonata</i>	Winged Water-starwort		v				Un	575
<i>Cardamine moirensis</i>	Riverina Bitter-cress		r				Un	5032
<i>Craspedia paludicola</i>	Swamp Billy-buttons		v				Un	4649
<i>Cullen parvum</i>	Small Scurf-pea	E	e	L	31			2773
<i>Cymbopogon obtectus</i>	Silky-heads		e				Un	904
<i>Cyperus flaccidus</i>	Lax Flat-sedge		v				Un	920
<i>Dianella longifolia</i> var. <i>grandis</i>	Glaucous Flax-lily		v				Un	4419
<i>Dianella tarda</i>	Late-flower Flax-lily		v				Un	5085
<i>Digitaria divaricatissima</i>	Umbrella Grass		v					1045
<i>Eulalia aurea</i>	Silky Browntop		r				Un	1328
<i>Leiocarpa panaetioides</i>	Woolly Buttons		r				Un	1945
<i>Lipocarpha microcephala</i>	Button Rush		v				Un	2020
<i>Maireana aphylla</i>	Leafless Bluebush		v				Un	2096
<i>Maireana microphylla</i>	Small-leaf Bluebush		e				Un	3865
<i>Myoporum montanum</i>	Waterbush		r				Un	2240
<i>Myriophyllum porcatum</i>	Ridged Water-milfoil	V	v	L				2257
<i>Rorippa eustylis</i>	Dwarf Bitter-cress		r				Un	2944
<i>Sida trichopoda</i>	Narrow-leaf Sida		r				Un	3147
<i>Swainsona sericea</i>	Silky Swainson-pea		v				Un	4946
<i>Templetonia stenophylla</i>	Leafy Templetonia		r				Un	3341
<i>Tripogon loliiformis</i>	Rye Beetle-grass		r				Un	3455
<i>Sida trichopoda</i>	Narrow-leaf Sida		r				Un	3147
<i>Swainsona sericea</i>	Silky Swainson-pea		v				Un	4946
<i>Templetonia stenophylla</i>	Leafy Templetonia		r				Un	3341
<i>Tripogon loliiformis</i>	Rye Beetle-grass		r				Un	3455

7. Yarrowonga Landscape Zone

7.1 Yarrowonga Landscape Zone description (cont'd)

Table 21. List of current threatened fauna and their conservation status in the Yarrowonga Landscape Zone (NRE 2002d)

English Name	Latin Name	Australian Status	Victorian Status	FFG Listed	FFG Action Statement Number	Recovery Plan	BNA Unassessed	Species number
Australasian Bittern	<i>Botaurus poiciloptilus</i>		EN				Un	197
Australasian Shoveler	<i>Anas rhynchotis</i>		VU				Un	212
Baillon's Crake	<i>Porzana pusilla</i>		VU				Un	50
Barking Owl	<i>Ninox connivens</i>		EN	L	166		Un	246
Black Falcon	<i>Falco subniger</i>		VU				Un	238
Blue-billed Duck	<i>Oxyura australis</i>		EN	L	174		Un	216
Bluenose(Trout) Cod	<i>Maccullochella macquariensis</i>	End	CR	L	38	Y		4093
Broad-shelled Tortoise	<i>Chelodina expansa</i>		EN					2016
Brolga	<i>Grus rubicunda</i>		VU	L	119			177
Bush Stone-curlew	<i>Burhinus grallarius</i>		EN	L	78			174
Diamond Firetail	<i>Stagonopleura guttata</i>		VU	L			Un	652
Freckled Duck	<i>Stictonetta naevosa</i>		EN	L	105			214
Giant Bullfrog	<i>Limnodynastes interioris</i>		CR	L				3060
Golden Perch	<i>Macquaria ambigua</i>		VU					4095
Great Egret	<i>Ardea alba</i>		VU	L	120			187
Grey Falcon	<i>Falco hypoleucos</i>		EN	L	83		Un	236
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>		EN	L	34			443
Ground Cuckoo-shrike	<i>Coracina maxima</i>		VU	L			Un	423
Hardhead	<i>Aythya australis</i>		VU				Un	215
Intermediate Egret	<i>Ardea intermedia</i>		CR	L	120			186
Little Egret	<i>Egretta garzetta</i>		EN		120			185
Murray Cod	<i>Maccullochella peelii peelii</i>		EN	L				4094
Musk Duck	<i>Biziura lobata</i>		VU				Un	217
Painted Snipe	<i>Rostratula benghalensis</i>		CR				Un	170
Powerful Owl	<i>Ninox strenua</i>		VU	L	92		Un	248
Red-chested Button-quail	<i>Turnix pyrrhorthorax</i>		VU				Un	19
River Blackfish	<i>Gadopsis marmoratus</i>		CR				Un	4127
Royal Spoonbill	<i>Platalea regia</i>		VU					181
Silver Perch	<i>Bidyanus bidyanus</i>		CR	L				4099
Superb Parrot	<i>Polytelis swainsonii</i>	Vul	EN	L	33			277
Swift Parrot	<i>Lathamus discolor</i>	End	EN	L	169	Y	Un	309
Tree Goanna	<i>Varanus varius</i>		VU				Un	2283
Warty Bell Frog	<i>Litoria raniformis</i>	Vul	EN				Un	3207
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>		VU	L	60			226

7. Yarrowonga Landscape Zone

7.2 Yarrowonga Landscape Zone priorities

7.2.1 Summary of priority biodiversity actions for Yarrowonga Landscape Zone:

- Protect and enhance native vegetation communities within Barmah State Park, Tocumwal, Cobram and Yarrowonga Regional Parks and Big Reedy Lagoon Wildlife Reserve. Conserve threatened flora and fauna taxa which these reserves support.
- Within State Forest along the Murray River floodplain, ensure all forest blocks (nominally SMZ117/01) identified by Todd (1999) and by Robinson (1998a) as 'priority' areas for conservation and / or reservation are: managed so as to fully protect their existing biodiversity value and potential; and are carefully reviewed as to the adequacy of their current tenure to provide long-term protection from the threat of timber harvesting and/or domestic grazing.
- Prevent further decline in biodiversity values of native vegetation due to domestic grazing on public land by removal of stock and fencing of relevant reserves where needed. Give priority to: Barmah State Park; Tocumwal, Cobram and Yarrowonga Regional Parks; Big Reedy Lagoon Wildlife Reserve; Bushland Reserves H28-31 & 42; all Murray River State Forest (SMZ 117/01); Public Land Water Frontage on Ulupna and Sheepwash Creeks; Strathmerton–Mywee Rail Reserve and associated Mywee Road roadside; all River Murray Reserve; Roadside Conservation Reserve L5 (Murray Valley Highway); and native grassland along Murray Valley Highway at Strathmerton and on Old Coach Road at Mywee.
- Fully protect high-quality roadsides including sites on Mywee Road and Old Coach Road, at Mywee; Roadside Conservation Reserve L5 (on Murray Valley Highway at Cobram East); and native grassland along Murray Valley Highway at Strathmerton.
- Pursue appropriate mechanisms to adequately protect and secure biodiversity values within Strathmerton–Mywee Rail Reserve, Mywee.
- Give priority to protection and management of Public Land Water Frontage on Ulupna and Sheepwash Creeks, Ulupna.
- Identify localised sites of high biodiversity value and provide appropriate protection and management. Select the most strategic sites around which to develop Local Landscape Plans. Aim to use vegetation restoration to expand and extend existing remnants across tenures. Priority sites include: Strathmerton–Mywee Rail Reserve with associated Mywee Road roadside; Bushland Reserves H28-31 with Public Land Water Frontage on Ulupna and Sheepwash Creeks; Bushland Reserve 42 with Roadside Conservation Reserve L5 (on Murray Valley Highway); native grassland along Murray Valley Highway at Strathmerton and on Old Coach Road at Mywee; freehold remnants north of Murray Valley Highway, between Bearii and Koonoomoo; and good-quality freehold wetlands (to be identified) on the Muckatah Depression. Other priority sites include: the freehold interfaces with Barmah State Park; Tocumwal, Cobram and Yarrowonga Regional Parks; Big Reedy Lagoon Wildlife Reserve; all Murray River State Forest (SMZ 117/01); and all River Murray Reserve.

7. Yarrowonga Landscape Zone

7.3 Private Land

Land Tenure Details:

This tenure type includes all private land in the zone, with associated creeklines and occupies over 90% of the total zone area. The zone contains good-quality remnant stands on freehold, most notably north of Murray Valley Highway, between Bearii and Koonoomoo. Commonly stands feature River Red Gum, Grey Box, Yellow Box or White Cypress-pine. These freehold remnants complement roadsides on many back-roads and along the wider easements of the major highways through the zone (see Other State Government). Unfortunately, most remnants on freehold have poorer quality understorey than many roadsides, due to more relentless grazing and more persistent weed invasion (especially of pasture grasses such as Wild Oat and canary-grass) on farmland. The Muckatah Depression (an extended 'dip' rather than a distinct drainage line) occurs largely on freehold within the zone, running from south-east of Yarrowonga nearly to Numurkah. This long shallow wetland (2909 ha) is listed (Site VIC053) in *A Directory of Important Wetlands in Australia* (EA 2001) and, with other associated swamps, provides important habitat for Brolga and supports an occurrence of Yellow-tongue Daisy.

Land Manager:

Private landholders

Stakeholders:

Key Lc, LGA, DSE, DPI, PV, CMA

Other TFN, LFW, BG, GAV, CVA, GNP, FNC, VAA, VFF

Threatened Biodiversity Assets (in brackets: Cons status Aust - upper case, Vic - lower case; followed by BNA priority / risk rankings for threatened taxa = 1A, 2B, etc., or un - unassessed):

EVCs: Vegetation types formerly supported on land in this tenure include *plains grassy woodland* (e), *pine box woodland* (e), *pine box woodland / riverina plains grassy woodlands mosaic* (e), *riverine grassy woodland / black box chenopod woodland / wetland mosaic* (e) and *riverine grassy woodland* (v). Remnants of these EVCs are typically dominated by Grey Box, Yellow Box, Black Box or White Cypress-pine.

Threatened flora: Mueller Daisy (Ve, 3A), Ridged Water-milfoil (Vv, 3B), River Swamp Wallaby-grass (Vk, un), Small Scurf-pea (Ee, 3A), Yarran Wattle (e, 3A), Yellow-tongue Daisy (v, 4B).

Threatened fauna: Apostlebird (v, 3B), Broad-shelled Tortoise (e, un), Brolga (v, 3B), Bush Stone-curlew (e, 1A), Giant Bullfrog (cen, 1A), Glossy Ibis (v, 1B), Great Egret (e, un), Grey-crowned Babbler (e, 1A), Intermediate Egret (cen, un), Little Egret (cen, 3A), Nankeen Night Heron (v, 1B), Royal Spoonbill (v, 1B), Silver Perch (cen, 3A), Superb Parrot (Ve, 1A), White-bellied Sea-eagle (e, un).



Brachyscome chrysoglossa
(Photo: John Eichler)



Little Egret (Photo: P. Menkhorst)

7. Yarrowonga Landscape Zone

7.3 Private Land (cont'd)

Recommended actions:

Protection of existing remnants:

- Identify and protect significant freehold remnants, giving priority to high-quality sites in the Bearii–Koonoomoo district and remnant wetlands on the Muckatah Depression (see under **Land tenure attributes**). Apply voluntary programs, incentives and/or planning controls, as appropriate, to protect biodiversity values.
- Give priority also to significant remnants in close proximity to sites identified as significant or *high-value* on other tenures in the zone.
- Promote exclusion of stock from habitat remnants, to maximise recovery and regeneration of remaining native vegetation.
- Protect and enhance status of unreserved stream frontages which connect with or extend existing Public Land Water Frontage reserves, notably on Ulupna and Sheepwash Creeks, Ulupna.
- Adhere strictly to native vegetation retention controls, focusing particular effort on retaining large trees and woodlots near sites used by threatened woodland taxa, including Superb Parrot, Grey-crowned Babbler, Bush Stone-curlew, Apostlebird and Giant Bullfrog.
- Encourage and assist Local Government Authorities to develop or upgrade local conservation strategies, including procedures for minimising clearing of remnants for subdivision.
- Assist Local Government Authorities to include any priority freehold remnants having strategic connective value or potential with roadside conservation plans.
- Ensure that Shire staff have knowledge of locations and importance of freehold remnants with existing or potential biodiversity value.
- Assist landholders to identify incentives for fencing remnants and for other strategically important management actions.

Management to enhance remnants for threatened taxa (BNA response level in brackets: 4 = full commitment, 3 = substantive participation, 2 = opportunistic action, 1 = watching brief):

- Supplement woodland / wetland habitats and enhance flow regimes on the Murray River floodplain, to benefit Giant Bullfrog (4).
- Control introduced predators, exclude domestic grazing, improve woodland connectivity and over time, aim to increase abundance of mature hollow-bearing trees to benefit Superb Parrot (4).
- Supplement woodland habitats to benefit Grey-crowned Babbler (4), Bush Stone-curlew (4) and Apostlebird (1).



Bush Stone-curlew (Photo: Viridans Biological Databases)

7. Yarrowonga Landscape Zone

7.3 Private Land (cont'd)

- Exclude domestic grazing to benefit Grey-crowned Babbler (4), Intermediate Egret (2), Small Scurf-pea (3), Yarran Wattle (3), Ridged Water-milfoil (1), Brolga (1) and Apostlebird (1).
- Control introduced predators to benefit Grey-crowned Babbler (4), Bush Stone-curlew (4), Brolga (1) and Apostlebird (1).
- Supplement wetland habitats to benefit Silver Perch (3), Royal Spoonbill (3), Nankeen Night Heron (3) and Great Egret (2).
- Enhance flow regimes to benefit Silver Perch (3), Little Egret (3), Glossy Ibis (3), Intermediate Egret (2), Great Egret (2), White-bellied Sea-eagle (2) and Ridged Water-milfoil (1) (Leslie 2001).
- Control weeds and numbers of introduced herbivores and macropods, to benefit Mueller Daisy (3).
- Reduce use of chemicals and other water contaminants and monitor water quality to benefit Ridged Water-milfoil (1).
- Modify domestic stocking levels to best benefit Yellow-tongue Daisy (1) and investigate reintroduction options.
- Determine management needs of River Swamp Wallaby-grass (2) on freehold in the zone.



Brachyscome muelleroides
(Photo: John Eichler)

Restoration of strategic vegetation blocks or linkages:

- Encourage and assist regeneration and consolidation of freehold remnants, giving priority to the areas of better-quality remnants identified above (**Land tenure attributes**).
- Also encourage and assist landholders to restore and expand habitats and improve connectivity to any nearby remnants on freehold, road reserves or other tenure, giving priority to properties which are close to sites identified as significant or *high-value* on other tenures in the zone.
- Encourage landholder participation (through Local Landscape Plans) to establish habitat linkages within and between good-quality freehold remnants.
- Arrange (in consultation with licensees) to fence out key unused roads and creeklines.
- Encourage and assist Landcare groups and Land for Wildlife extension officers to inform landholders of their potential role in conserving biodiversity and to coordinate their involvement for the best possible outcome.
- Co-ordinate restoration and revegetation initiatives to assist landholders and the Shire in consolidating local remnants.

7. Yarrowonga Landscape Zone

7.3 Private Land (cont'd)

- On freehold land abutting roadside habitats of Grey-crowned Babbler, Superb Parrot and Bush Stone-curlew, promote and assist creation of buffer strips (at least 15 m wide and 500 m long) which have preferably been undisturbed by previous agricultural use.
- In consultation with Goulburn-Broken CMA, develop habitat management plans for streamsides on freehold, with particular emphasis upon protecting and expanding habitat nodes (e.g. creekline-roadside intersects).

EXISTING POLICIES, PLANS OR PROGRAMS supporting one or more of the recommended actions:

- FFG Action Statement – Small Scurf-pea (31).
- FFG Action Statement – Superb Parrot (33).
- FFG Action Statement – Grey-crowned Babbler (34).
- FFG Action Statement – Predation by Red Fox (44).
- FFG Action Statement – White-bellied Sea-eagle (60).
- FFG Action Statement – Bush Stone-curlew (78).
- FFG Action Statement – Predation by Cat (80).
- FFG Action Statement – Brolga (119).
- FFG Action Statement – Great Egret (120).
- FFG Action Statement – Intermediate Egret (120).
- FFG Action Statement – Little Egret (120).
- JAMBA – Great Egret.
- CAMBA – Great Egret, White-bellied Sea-eagle, Glossy Ibis.
- Management Plan – Brolga (Arnol et al. 1984).
- Management Plan – Superb Parrot (Webster & Ahern 1992).

7. Yarrawonga Landscape Zone

7.4 Public Land Water Frontage

Land Tenure Details:

Several segments of Public Land Water Frontage (K1) occur in the zone. These are on creeklines at Bearii and Ulupna West and along Ulupna and Sheepwash Creeks, Ulupna. In nominating 'Barmah and Tocumwal forests' to his list of 'priorities for nature conservation reservation and management in the eastern northern plains of Victoria', Robinson (1998a) identified Public Land Water Frontage on Ulupna and Sheepwash Creeks as a component of that site, noting that the creekline contained remnants of native vegetation significant in the context of the local land system.

Land Manager:

Land Victoria

Stakeholders:

Key CMA, DSE, Private

Other LGA, Lc, WAG, RAG, LFW, GAV, CVA, GNP, VFF, VAA

Threatened Biodiversity Assets (in brackets: Cons status Aust - upper case, Vic - lower case; followed by BNA priority / risk rankings for threatened taxa = 1A, 2B, etc., or un - unassessed):

EVCs: Vegetation on Ulupna Creek system was formerly *drainage line complex* (e), dominated by large River Red Gum, flanked by *riverine grassy woodland* (v). This creekline tree cover persists, although the surrounding woodlands have been fragmented by settlement. The other K1 segments to the west formerly supported *riverine grassy woodland* / *riverine sedgy forest* / *wetland mosaic* (d). This EVC persists in the creekline, however the understorey is heavily invaded with volunteer grasses.

Threatened flora: Umbrella Grass (v, un), River Swamp Wallaby-grass (Vk, un).

Threatened fauna: Bush Stone-curlew (e, un).



Bush Stone-curlew (Photo: DSE/McCann)

Recommended actions:

Protection of existing remnants:

- Monitor the condition of stream frontages in the zone, especially with respect to fencing and grazing, giving priority to existing well-connected water frontage corridors.
- Protect and enhance Public Land Water Frontage status in the zone, giving priority to the frontage identified above (**Land tenure attributes**) as warranting 'priority for reservation and management' and providing maximum protection for existing values.
- Exclude domestic stock grazing throughout the tenure, to protect fauna habitat and permit regeneration of remaining native vegetation.
- Control the spread of pasture-grasses from adjacent cropping land.

7. Yarrowonga Landscape Zone

7.4 Public Land Water Frontage (cont'd)

Management to enhance remnants for threatened taxa (BNA response level in brackets: 4 = full commitment, 3 = substantive participation, 2 = opportunistic action, 1 = watching brief):

- Increase woodland tree-cover, retain fallen timber and branches and implement control of introduced predators, to benefit Bush Stone-curlew (2), notably on Ulupna Creek.
- Restore more natural flow regimes and exclude domestic grazing, to benefit River Swamp Wallaby-grass (2), notably on Ulupna Creek.
- Control competing weeds and modify stocking levels as necessary, to benefit Umbrella Grass (2), notably on Ulupna Creek.
- Ensure firewood harvesting is excluded from the tenure, in order to conserve habitat resources for woodland fauna.
- Exclude desnagging or flow improvement works in streams within the tenure.



Amphibromus fluitans (Photo: Geoffrey Carr)

Restoration of strategic vegetation blocks or linkages:

- Regenerate and revegetate Public Land Water Frontage on Ulupna–Sheepwash Creek system to improve its connectivity with the adjacent riverine forests along the Murray River.
- More widely, initiate weed control and revegetation of degraded creekline frontages, giving priority to sections where increased connectivity will be most strategic and potentially effective.
- Identify adjoining or nearby remnants having strategic connectivity value or potential and encourage complementary revegetation using incentives and voluntary programs.

EXISTING POLICIES, PLANS OR PROGRAMS supporting one or more of the recommended actions:

- FFG Action Statement – Bush Stone-curlew (78).
- Forest Management Plan – Mid-Murray FMA (NRE 2002e).
- ECC (2001) recommendation to redesignate K1 as Nature Features Reserve.

7. Yarrawonga Landscape Zone

7.5 Water Production

Land Tenure Details:

The tenure is represented in the zone by the irrigation storage Lake Mulwala (D57, 1360 ha), which supplies Yarrawonga. This is a man-made storage on the Murray River and much of the neighbouring native vegetation has been cleared. Nevertheless, it provides certain habitat values for a range of threatened waterbird and fish species.

Land Manager:

Rural Water Authority, DSE

Stakeholders:

Key DPI, CMA

Other LGA, FNC, BG, TSN, PV, VAA

Threatened Biodiversity Assets (in brackets: Cons status Aust - upper case, Vic - lower case; followed by BNA priority / risk rankings for threatened taxa = 1A, 2B, etc., or un - unassessed):

EVCs: The pre-1750 vegetation formerly occupying the lake bed of D57 was *riverine grassy woodland / riverine sedgy forest / wetland mosaic* (d), now eliminated. Adjacent plains to the south supported *pine box woodland* (e) and *plains grassy woodland* (e), now predominantly cleared with only odd fragments of the latter EVC persisting around the lake margin.

Threatened flora: None recorded.

Threatened fauna: Bluenose Cod (Ee, un), Silver Perch (cen, 3A), Freckled Duck (e, 3A), Murray Cod (v, 3B), Golden Perch (v, 3B), Nankeen Night Heron (v, un), Crimson-spotted Rainbowfish (dd, 4B).



Bluenose Cod (Photo: DSE)

Recommended actions:

Protection of existing remnants:

- Maintain status of D57, to conserve and enhance riparian habitat values for flora, fish and waterbirds whilst providing for recreation and water supply purposes.
- Encourage cooperation of adjoining landholders or land managers to protect existing values from external degrading processes.

7. Yarrowonga Landscape Zone

7.5 Water Production (cont'd)

Management to enhance remnants for threatened taxa (BNA response level in brackets: 4 = full commitment, 3 = substantive participation, 2 = opportunistic action, 1 = watching brief):

- Restore more natural flow regimes to benefit Silver Perch (3), Freckled Duck (3), Bluenose Cod (2), Murray Cod (1), Golden Perch (1) and Crimson-spotted Rainbowfish (1).
- Supplement habitat of slow-flowing waters with debris and reed-cover to benefit Silver Perch (3).
- Also supplement and enhance peripheral and instream habitats, providing a range of substrate options (logs, gravel, weed, boulders) and flow conditions, including access to shallow-flooded backwaters, to facilitate spawning of Bluenose Cod (2), Murray Cod (1) and Golden Perch (1).
- Provide shallow feeding sites for Freckled Duck (3).
- Supplement riparian tree vegetation for roosts and shallow wetlands for feeding, to benefit Nankeen Night Heron (2).

Restoration of strategic vegetation blocks or linkages:

- Encourage collaboration with adjoining landholders or land managers to restore buffer connectivity via creekline and other remnants.

EXISTING POLICIES, PLANS OR PROGRAMS supporting one or more of the recommended actions:

- FFG Action Statement – Bluenose Cod (38).
- FFG Action Statement – Freckled Duck (105).
- Recovery Plan – Trout Cod (Brown et al. 1998)

7. Yarrowonga Landscape Zone

7.6 State Forest

Land Tenure Details:

The tenure includes only State Forest (F1; 3732 ha) extending intermittently along the Murray River floodplain from Ulupna to Yarrowonga. All parcels involved are zoned Special Management Zone (SMZ) 117/01 under the Mid-Murray Forest Management Plan (NRE 2002e). Todd (1999) identified this sequence of forest parcels ('Murray River State Forest – Ulupna to Yarrowonga') as one of his 'priority areas for protection and establishment of protected areas' in the context of his 'Riverina' bioregion. Todd's nominated site (which covers all State Forest tenure in the zone) contains high-priority vegetation types, supports threatened flora and fauna species and is 'an important vegetated corridor under threat from future timber harvesting and grazing practices'. Part of the above State Forest, between Cobram East and Burramine North, was also included in Robinson's (1998a) 'Yarrowonga / Cobram State Forests, Bourke Bend–Cemetery Bend' site which he included on his list of 'priorities for nature conservation reservation and management in the eastern northern plains of Victoria'. As well as containing important biota and vegetation types, Robinson noted that the site also supported high-quality habitat in terms of tree size, understorey and groundcover.

Land Manager:

Forests Service (DSE)

Stakeholders:

Key PV, CMA

Others VEAC, VNPA, VAA, TSN, BG, GNP, FNC, VCM, LGA

Threatened Biodiversity Assets (in brackets: Cons status Aust - upper case, Vic - lower case; followed by BNA priority / risk rankings for threatened taxa = 1A, 2B, etc., or un - unassessed):

EVCs: F1 in the Murray River State Forest formerly supported River Red Gum-dominated *riverine grassy woodland / riverine sedgy forest / wetland mosaic* (d) as the major vegetation type. This EVC was far more extensive along the Murray River frontage prior to settlement, but a more or less effective riparian corridor still persists along the floodplain today—generally on areas closest to the river. A number of higher and drier vegetation types formerly flanked the main River Red Gum belt. These included *riverine grassy woodland* (v - VR), *riverine grassy woodland / riverina plains grassy woodland complex* (e - VR), *sand ridge woodland* (e - VR) and *pine box woodland / riverina plains grassy woodland mosaic* (e - VR). While often including River Red Gum elements, these EVCs featured Grey Box, Yellow Box, White Cypress-pine and various wattles and native grasses. At scattered locations, these vegetation types are still represented by localised remnants.

7. Yarrawonga Landscape Zone

7.6 State Forest (cont'd)

Threatened flora: Muller Daisy (e, un), River Swamp Wallaby-grass (Vk, 1B), Small scurf-pea (Ee, un), Umbrella Grass (v, un).

Threatened fauna: Bluenose Cod (Ecen, 4A), Broad-shelled Tortoise (e, 1B), Golden Perch (v, 1B), Great Egret (v, 1A), Intermediate Egret (e, 2A), Little Egret (e, 2A), Murray Cod (e, 1B), Nankeen Night Heron (v, 2B), Royal Spoonbill (v, 2B), Silver Perch (cen, un), Superb Parrot (Ve, 1A), White-bellied Sea-eagle (e, 3A).



Broad-shelled Tortoise
(Photo: Virridans Biological Databases)

Recommended actions:

Protection of existing remnants:

- Review status and protect habitat condition and connectivity, of State Forest blocks in the zone, giving priority to the high-value remnants identified above (**Land tenure attributes**).
- Identify and ensure protection of old growth stands and individual large old trees in production forests and on forest margins and roadsides and exclude grazing.
- Protect old-growth stands and individual large old trees from damage during fire protection works, as well as from harvesting.
- Protect biodiversity values from effects of excessive firewood harvesting throughout the tenure.
- Reintroduce ecological flooding regimes throughout the tenure (and associated habitats) so as to equate as far as possible, with pre-European frequencies.

Management to enhance remnants for threatened taxa (BNA response level in brackets: 4 = full commitment, 3 = substantive participation, 2 = opportunistic action, 1 = watching brief):

- Supplement habitat (providing structurally diverse substrates) and enhance flow regimes (providing fast-flowing streams of variable depth) to benefit Bluenose Cod (2).
- Supplement habitat by ensuring non-uniform depths and currents in streams and billabongs to benefit Golden Perch (3) and Silver Perch (2).
- Enhance or restore natural water regimes in forest sites suitable for Great Egret (4), White-bellied Sea-eagle (3), Golden Perch (3), Murray Cod (3), Broad-shelled Tortoise (3), River Swamp Wallaby-grass (3) and Silver Perch (2).
- Exclude grazing from forest sites supporting, or potentially suitable for Broad-shelled Tortoise (3) and River Swamp Wallaby-grass (3).



Great Egret (Photo: Virridans Biological Databases)

7. Yarrowonga Landscape Zone

7.6 State Forest (cont'd)

- Conserve dense riparian tree vegetation for roosts and shallow wetlands for feeding, to benefit Nankeen Night Heron (2).
- Manage grazing pressure from macropods and introduced herbivores to benefit River Swamp Wallaby-grass (3).

Restoration of strategic vegetation blocks or linkages:

- Give priority to the regeneration and revegetation of degraded areas within the priority sites described above (see **Land tenure attributes**).
- Encourage neighbouring landholders and land managers to retain and enhance freehold, streamside or roadside remnants adjoining or close to State Forest, giving priority to locations where this effort would be most likely to benefit priority sites described above.

EXISTING POLICIES, PLANS OR PROGRAMS supporting one or more of the recommended actions:

- FFG Action Statement – Superb Parrot (33).
- FFG Action Statement – Bluenose Cod (38).
- FFG Action Statement – White-bellied Sea-eagle (60).
- FFG Action Statement – Great Egret (120).
- FFG Action Statement – Intermediate Egret (120).
- FFG Action Statement – Little Egret (120).
- Recovery Plan – Trout Cod (Brown et al. 1998)
- JAMBA – Great Egret.
- CAMBA – Great Egret, White-bellied Sea-eagle.
- Forest Management Plan – Mid-Murray FMA (NRE 2002e).

7. Yarrowonga Landscape Zone

7.7 Other State Government

Land Tenure Details:

The tenure includes all unused roads, River Murray Reserve (E1) and a Roadside Conservation Reserve (L5, on Murray Valley Highway, at Cobram East). It also includes sections of Benalla–Yarrowonga and Seymour–Tocumwal Railway Reserves, Numurkah–Picola Disused Railway Reserve and Murray Valley and Goulburn Valley Highway easements. The zone contains a number of Recreation Reserves (O4) and Utility Reserves (S12). Management of some or all of the latter reserves may be delegated to Local Government Authorities.

Strathmerton–Mywee Rail Reserve (26 ha), a 7 km sub-section of Seymour–Tocumwal line, was recommended by Robinson (1998a) as a priority for 'nature conservation reservation and management in the eastern northern plains'. Todd (1999) identified this same site amongst his 'priority areas for protection and establishment of protected areas' in the context of 'Riverina' bioregion. Strathmerton–Mywee Rail Reserve, though still in use, retains an impressive range of biodiversity assets, including Grey-crowned Babbler. Robinson (1998a) also nominated as a priority area 'Yarrowonga and Cobram forests' (site 15), which includes all E1 occurring in this zone.

The breadth of Murray Valley Highway (being mostly a three-chain [60m] road) was noted by Cook (1997) as a likely reason for the extent of good-quality remnants which it retains today, at least in Shire of Moira. For example, L5 extends along more than 20 km of highway and is designated as a site of habitat and/or botanical significance (LCC 1985). Cook (1997) identified roadside remnants on Murray Valley Highway, between Labuan and Lorenzs Roads, Strathmerton (Site 19), as of 'high significance' for native grassland values.

Land Manager:

Land Victoria, Public Transport Corporation, VicRoads, LGA

Stakeholders:

Key DSE, CMA

Other VAA, BG, TSN, GNP, FNC, Private

Threatened Biodiversity Assets (in brackets: Cons status Aust - upper case, Vic - lower case; followed by BNA priority / risk rankings for threatened taxa = 1A, 2B, etc., or un - unassessed):

EVCs: Former vegetation in E1 was predominantly River Red Gum-dominated *riverine grassy woodland* / *riverine sedgy forest* / *wetland mosaic* (d) and, though degraded, much of this EVC remains today. The more extensive EVCs formerly present on land traversed by highways and railways in the zone included *plains grassy woodland* (e), *pine box woodland* (e), *pine box woodland / riverina plains grassy woodlands mosaic* (e), *riverine grassy woodland / black box chenopod woodland / wetland mosaic* (e) and *riverine grassy woodland* (v). Remnants of these EVCs are typically dominated by Black Box, Grey Box, Yellow Box and White Cypress-pine.

7. Yarrawonga Landscape Zone

7.7 Other State Government (cont'd)

While many remnants persist, very few retain intact or near-natural understorey elements, due predominantly to grazing and weed invasion. Strathmerton–Mywee Rail Reserve today supports 'one of the very few examples of sand ridge woodland' still retaining native vegetation in the eastern northern plains (Robinson 1998a). Roadside remnants along L5 are described as 'impressive and significant stands and individuals of Yellow Box with some White Cypress-pine' (LCC 1985). Cook's (1997) Site 19 on Murray Valley Highway, Strathmerton, retains abundant White Cypress-pine, with understorey including Tall Wallaby-grass and Corkscrew Spear-grass, on a combined roadside verge of 50m width. Serious woody weeds in the tenure include Pepper-tree and European Olive.

Threatened flora: None recorded.

Threatened fauna: Bluenose Cod (Ecen, un), Freckled Duck (e, 3A), Golden Perch (v, 3B), Great Egret (e, un), Grey-crowned Babbler (e, un), Murray Cod (v, 3B), Silver Perch (cen, 3A), Superb Parrot (Ve, un),



Recommended actions:

Protection of existing remnants:

- Ensure that Public Transport Corporation staff are aware of the location of significant biodiversity assets on Strathmerton–Mywee Rail Reserve and ensure that measures are taken to properly conserve these assets. Investigate whether a Public Authority Management Agreement should be negotiated.
- Exclude domestic grazing, timber harvesting and other activities that threaten remaining biodiversity values of River Murray Reserve in the zone.
- Ensure that VicRoads field staff are aware of the location of road reserves of high significance (including L5) on Murray Valley Highway and that appropriate management and protection is undertaken to conserve biodiversity values. Investigate whether a Public Authority Management Agreement should be negotiated.
- Initiate programs to routinely control woody environmental weeds occurring in native remnants, giving priority to significant sites described above (**Land tenure attributes**).
- Assist public land managers to develop information sources and incentives which encourage olive-producers to control the spread of 'escaped' plants onto roadsides or other reserves adjacent or near to olive plantations.
- In consultation with licensees, review status of unused roads and, where habitat values (or potential values) exist, assess fencing, grazing exclusion and regeneration to ensure habitat protection.
- Protect any fenced, ungrazed or intact areas of native vegetation on unused roads from future stock disturbance, timber removal and weed invasion.

7. Yarrawonga Landscape Zone

7.7 Other State Government (cont'd)

Management to enhance remnants for threatened taxa (BNA response level in brackets: 4 = full commitment, 3 = substantive participation, 2 = opportunistic action, 1 = watching brief):

- Restore more natural flows and supplement instream habitats to benefit Silver Perch (3), Bluenose Cod (2), Murray Cod (1) and Golden Perch (1) in River Murray Reserve.
- Over time, aim to increase abundance of mature hollow-bearing trees in E1 to benefit Superb Parrot (2).
- Monitor habitat of Grey-crowned Babbler (2) colonies and take any opportunities to enhance existing or potential habitat, including by controlling introduced predators and excluding stock.
- Supplement woodland and wetland habitats, enhance flow regimes and avoid human disturbance of sites, to benefit Great Egret (2).

Restoration of strategic vegetation blocks or linkages:

- Initiate regeneration or revegetation works to expand and restore former native vegetation communities on Strathmerton–Mywee Rail Reserve and significant Murray Valley Highway roadsides. Encourage and assist adjacent land managers (notably of roadsides) to retain or restore connecting remnants.
- Investigate options for restoring degraded biodiversity values in River Murray Reserve forest within the zone.
- In consultation with licensees, improve habitat quality and connectivity of unused roads.

EXISTING POLICIES, PLANS OR PROGRAMS supporting one or more of the recommended actions:

- FFG Action Statement – Superb Parrot (33).
- FFG Action Statement – Grey-crowned Babbler (34).
- FFG Action Statement – Bluenose Cod (38).
- FFG Action Statement – Predation by Red Fox (44).
- FFG Action Statement – Predation by Cat (80).
- FFG Action Statement – Freckled Duck (105).
- Management Plan – Superb Parrot (Webster & Ahern 1992).
- Recovery Plan – Trout Cod (Brown et al. 1998)
- JAMBA – Great Egret.
- CAMBA – Great Egret.
- ECC (2001) recommendation to redesignate most O4 reserves as Community Use Areas.

7. Yarrawonga Landscape Zone

7.8 Local Government

Land Tenure Details:

The tenure includes municipal roadsides and township land (T1) throughout the zone. The zone contains good-quality roadside remnants on many back-roads between Bearii and Koonoomoo, commonly featuring River Red Gum, Grey Box, Yellow Box and White Cypress-pine. These complement remnant stands on freehold and along the wider road easements of the major highways through the zone (see Other State Government). Robinson (1998a), in his identification of 'priorities for nature conservation reservation and management in the eastern northern plains of Victoria', nominated Mywee Road road reserve (and adjoining Strathmerton-Mywee Rail Reserve) for inclusion (Site 9). Cook (1997) identified roadside remnants on Old Coach Road, Mywee (Site 23), as a site of 'high significance' for native grassland values. Roadside remnants become progressively sparser and poorer in condition in the south of the zone (especially to the east), where scattered Grey Box and River Red Gum are the main species seen, with occasional Black Box associated with wetlands along the Muckatah Depression. Canary-grass becomes increasingly invasive in wetter roadsides in the south of the zone.

Land Manager:

Local Government Authority

Stakeholders:

Key DSE, CMA, PV

Other Private, BG, LFW, FNC, CVA, GAV

Threatened Biodiversity Assets (in brackets: Cons status Aust - upper case, Vic - lower case; followed by BNA priority / risk rankings for threatened taxa = 1A, 2B, etc., or un - unassessed):

EVCs: The more extensive EVCs formerly present on land traversed by municipal roads in the zone included *plains grassy woodland* (e), *pine box woodland* (e), *pine box woodland / riverina plains grassy woodlands mosaic* (e), *riverine grassy woodland / black box chenopod woodland / wetland mosaic* (e) and *riverine grassy woodland* (v). Remnants of these EVCs are typically dominated by Black Box, Grey Box, Yellow Box and White Cypress-pine. While many remnants persist, very few retain intact or near-natural understorey elements, due predominantly to grazing and weed invasion. Mywee Road road reserve (and adjacent rail reserve) today still supports 'one of the very few examples of sand ridge woodland' still retaining native vegetation in the eastern northern plains (Robinson 1998a). Cook's (1997) Site 23 on Old Coach Road, Mywee, retains River Red Gum and Yellow Box in the tree cover, with grassland layer including Woolly Buttons (r) and a few specimens of Leafless Bluebush (v).

Threatened flora: Mueller Daisy (Ve, un), Ridged Water-milfoil (Vv, un), River Swamp Wallaby-grass (Vk, un), Small Scurf-pea (Ee, 3A), Yarran Wattle (e, 4A), Yellow-tongue Daisy (v, un).

7. Yarrawonga Landscape Zone

7.8 Local Government (cont'd)

Threatened fauna: Apostlebird (v, un), Bush Stone-curlew (e, un), Brolga (v, un), Giant Bullfrog (cen, un), Glossy Ibis (v, un), Great Egret (e, un), Grey-crowned Babbler (e, 2A), Intermediate Egret (cen, un), Little Egret (cen, un), Nankeen Night Heron (v, un), Royal Spoonbill (v, un), Silver Perch (cen, un), Superb Parrot (Ve, un), White-bellied Sea-eagle (e, un).

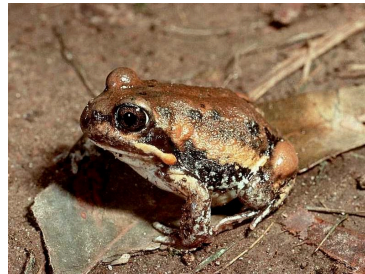
Recommended actions:

Protection of existing remnants:

- Protect existing roadside remnants, giving priority to the *high-quality* sites identified by Robinson (1998a) and Cook (1997) above (**Land tenure attributes**) and to any others having mature or hollow-bearing trees and/or relatively intact understorey and ground layers.
- Provide fencing and sign-posting of all *high-quality* remnants.
- Encourage removal or control of grazing on all road reserves retaining native vegetation communities or significant components.
- Ensure that Shire staff (especially road maintenance) are aware of the location of significant roadsides.
- Assist Shires to develop or upgrade roadside conservation plans and encourage integration with voluntary efforts on adjacent tenures. Promote voluntary programs (e.g. Land for Wildlife) and/or planning overlays, as tools to assist Shires.
- Avoid removal from roadside habitats of ground litter, fallen timber, logs or dead-standing trees, which provide valuable shelter and forage resources for Giant Bullfrog, Grey-crowned Babbler, Bush Stone-curlew and Apostlebird.
- Monitor known sites of Giant Bullfrog on Murray floodplain and ensure full protection of habitat.
- Identify in Shire roadside conservation plans known and likely sites of these taxa and advise CFA to avoid or limit control burning of these sites.
- Inform managers of adjacent freehold land of the presence of significant remnants and/or threatened species on roadsides and the likely impacts of pasture improvement on these assets.



Brolga (Photo: DSE/McCann)



Giant Bullfrog (Photo: Peter Robertson)

7. Yarrawonga Landscape Zone

7.8 Local Government (cont'd)

Management to enhance remnants for threatened taxa (BNA response level in brackets: 4 = full commitment, 3 = substantive participation, 2 = opportunistic action, 1 = watching brief):

- Improve diversity and cover of native understorey, improve connectivity and retain fallen tree debris to supplement roadside habitat and over time, aim to increase the abundance of mature woodland trees for Grey-crowned Babbler (3), Superb Parrot, Bush Stone-curlew and Apostlebird.
- Enhance flow regimes on roadside wetlands to benefit Great Egret, Little Egret, White-bellied Sea-eagle, Royal Spoonbill, Giant Bullfrog, Silver Perch, Glossy Ibis and Intermediate Egret.
- Supplement riparian vegetation (including tree cover) on roadside wetlands to benefit Great Egret, Royal Spoonbill, Giant Bullfrog, Nankeen Night Heron, Brolga and Glossy Ibis.
- Exclude domestic stock from roadsides supporting, or potentially suitable for, Grey-crowned Babbler (3), Superb Parrot, Intermediate Egret, Brolga, Apostlebird and Yarran Wattle.
- Control foxes and cats to minimise predation on Grey-crowned Babbler (3), Bush Stone-curlew, Apostlebird and Brolga.
- Modify stocking levels as necessary to benefit Small Scurf-pea (3) and Yellow-tongue Daisy (2).
- Install signage to improve protection of Small Scurf-pea (3).
- Control weeds to benefit Mueller Daisy (2) and Yellow-tongue Daisy (2).
- Control population levels of macropods and introduced herbivores to benefit Mueller Daisy (2).
- Determine management needs for Ridged Water-milfoil (2) and River Swamp Wallaby-grass (2) at known sites.



Apostlebird (Photo: DSE/McCann)



Cullen parvum (Photo: John Eichler)

7. Yarrawonga Landscape Zone

7.8 Local Government (cont'd)

Restoration of strategic vegetation blocks or linkages:

- Encourage and assist regeneration and consolidation of significant roadside remnants, giving priority to *high value* sites identified above (**Land tenure attributes**). In particular, initiate regeneration or revegetation works as necessary to expand and restore former native vegetation communities on Mywee Road road reserve (adjacent to Strathmerton–Mywee Rail Reserve). Encourage and assist adjacent land managers (notably Public Transport Corporation) to retain or restore connecting remnants.
- Extend and expand good-quality roadside / creekline habitat linkages, giving priority to sites known or likely to support colonies of Grey-crowned Babbler and targeting suitable sites in proximity to a known colony.
- In expanding linear habitat networks, utilise nodes on creek-crossings, intersections with other road reserves or patches on adjacent freehold.
- Liaise with landholders on adjacent properties to establish habitat strips by which to broaden roadside habitat for fauna and to expand significant flora stands.
- Liaise with landholders to fence across paddock corners at key intersections of roadside treelines, to maximise habitat availability for fauna (Robinson & Davidson, in prep.).

EXISTING POLICIES, PLANS OR PROGRAMS supporting one or more of the recommended actions:

- FFG Action Statement – Small Scurf-pea (31).
- FFG Action Statement – Superb Parrot (33).
- FFG Action Statement – Grey-crowned Babbler (34).
- FFG Action Statement – Predation by Red Fox (44).
- FFG Action Statement – White-bellied Sea-eagle (60).
- FFG Action Statement – Bush Stone-curlew (78).
- FFG Action Statement – Predation by Cat (80).
- FFG Action Statement – Brolga (119).
- FFG Action Statement – Great Egret (120).
- FFG Action Statement – Great Intermediate (120).
- FFG Action Statement – Great Little (120).
- JAMBA – Great Egret.
- CAMBA – Great Egret, White-bellied Sea-eagle, Glossy Ibis.
- Management Plan – Brolga (Arnol et al. 1984).
- Management plan for Superb Parrot (Webster & Ahern 1992).



White-bellied Sea-eagle
(Photo: Mike Carter)

7. Yarrowonga Landscape Zone

7.9 Parks and Reserves

Land Tenure Details:

The zone contains the easternmost section of Barmah State Park (A2, part only of 7 900 ha), Tocumwal Regional Park (A6, 310 ha), Cobram Regional Park (A7, 594 ha), Yarrowonga Regional Park (A8, 390 ha), Big Reedy Lagoon Wildlife Reserve (C30, 285 ha) and Bushland Reserves H28-31 & 42 (total area 54 ha). Bushland Reserves H28-31 are in close proximity to good remnants on Ulupna–Sheepwash Creek system (Public Land Water Frontage), while H42 abuts Roadside Conservation Reserve L5 (Other State Government). The A2 segment includes Ulupna Island and a strip of Murray River frontage connecting this to Top Island (in Barmah Landscape Zone). Like A2, A6-8 also have river frontage. Robinson (1998a), in identifying 'priorities for nature conservation reservation and management in the eastern northern plains of Victoria', nominated 'Barmah and Tocumwal forests' (taking in A2 and A6) for inclusion, based upon both the significance of vegetation units and the presence of multiple threatened species of flora and fauna. C30 adjoins both A8 and River Murray Reserve (E1, see Other State Govt.) and is a large, intermittent wetland fringed with River Red Gum and valuable as a breeding and feeding site for waterbirds (LCC 1985).

Land Manager:

Parks Victoria

Stakeholders:

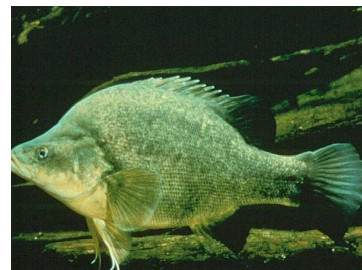
Key DSE, CMA

Other VEAC, VNPA, VAA, TSN, BG, GNP, FNC, Private, LGA

Threatened Biodiversity Assets (in brackets: Cons status Aust - upper case, Vic - lower case; followed by BNA priority / risk rankings for threatened taxa = 1A, 2B, etc., or un - unassessed):

EVCs: *Riverine grassy woodland / riverine sedgy forest / wetland mosaic* (d) was the predominant pre-1750 vegetation type on A2, A6, A7 and A8 and (although degraded) remains so today. Ulupna Creek, within A2, supported *drainage line complex* (e), still evident today. C30 supported the rare EVC *lagoon wetland* (e), flanked by *riverine grassy woodland / riverine sedgy forest / wetland mosaic* (d) and *pine box woodland / riverina plains grassy woodland mosaic* (e). However, both the lagoon wetland vegetation and the drier woodland mosaic, no longer remain. H29-31 occur on former *riverine grassy woodland* (v) at Ulupna and are dominated by River Red Gum. H28, at Katunga, formerly supported *plains grassy woodland* (e) and remains Grey Box-dominated, while H42, formerly on *pine box woodland* (e), still carries Yellow Box (LCC 1983).

Threatened flora: Mueller Daisy (Ve, un), River Swamp Wallaby-grass (V, un), Ridged Water-millfoil (Vv, un), Small Scurf-pea (Ee, un), Umbrella Grass (v, un).



Golden Perch (Photo: DSE)

7. Yarrawonga Landscape Zone

7.9 Parks and Reserves (cont'd)

Threatened fauna: Bluenose (Trout) Cod (Ec, 3A), Golden Perch (v, 1B), Great Egret (e, 1A), Intermediate Egret (c, 4A), Little Egret (e, 3A), Murray Cod (v, 1B), Royal Spoonbill (v, 3B), Silver Perch (c, 4A), Superb Parrot (Ve, 2A), White Bellied Sea-eagle (v, 4A).

Recommended actions:

Protection of existing remnants:

- Assess habitat values and monitor condition on all reserves within the tenure and ensure that protection of biodiversity values is adequate and effective. For A2, in particular, ensure full implementation of Barmah State Park and Barmah State Forest Management Plan.
- Pursue complete removal of domestic grazing and timber harvesting from the tenure, in order to maximise the viability and security of existing biodiversity values.
- Reintroduce ecological flooding regimes throughout the tenure (and associated habitats) so as to equate as far as possible, with pre-European frequencies.

Management to enhance remnants for threatened taxa (BNA response level in brackets: 4 = full commitment, 3 = substantive participation, 2 = opportunistic action, 1 = watching brief):

- Supplement riparian habitat, exclude human disturbance and enhance wetland regimes to benefit Great Egret (4).
- Enhance flow regimes (quiet or sluggish waters of variable depth and with diverse substrates) to benefit Golden Perch (3) and Murray Cod (3).
- Enhance flow regimes (shallow wetlands) and supplement riparian vegetation or trees (for roosts / nests) to benefit Royal Spoonbill (1).



Royal Spoonbill (Photo: Peter Menkhorst)

Restoration of strategic vegetation blocks or linkages:

- Promote regeneration and revegetation of degraded areas within the tenure, giving priority to sites within A2, A6–8 and C30 and to EVCs according to bioregional conservation status.
- Investigate with neighbouring landholders or land managers, options to collaborate in bolstering connectivity adjacent to Bushland Reserves H28-31 & 42, WR C30, or along margins of the State Park (A2) or Regional Parks (A6–8).

7. Yarrowonga Landscape Zone

7.9 Parks and Reserves (cont'd)

EXISTING POLICIES, PLANS OR PROGRAMS supporting one or more of the recommended actions:

- FFG Action Statement – Small Scurf-pea (31).
- FFG Action Statement – Superb Parrot (33).
- FFG Action Statement – Predation by Red Fox (44).
- FFG Action Statement – White-bellied Sea-eagle (60).
- FFG Action Statement – Predation by Cat (80).
- FFG Action Statement – Brolga (119).
- FFG Action Statement – Great Egret (120).
- FFG Action Statement – Great Intermediate (120).
- FFG Action Statement – Great Little (120).
- JAMBA – Great Egret.
- CAMBA – Great Egret, White-bellied Sea-eagle.
- Management Plan – Brolga (Arnol et al. 1984).
- Management plan for Superb Parrot (Webster & Ahern 1992).
- Forest Management Plan – Mid-Murray FMA (NRE 2002e).
- Management Plan – Barmah State Park and Barmah State Forest (DCE 1992).
- ECC (2001) recommendation to recategorise Bushland Reserves H28-31 & 42 as Nature Features Reserve.