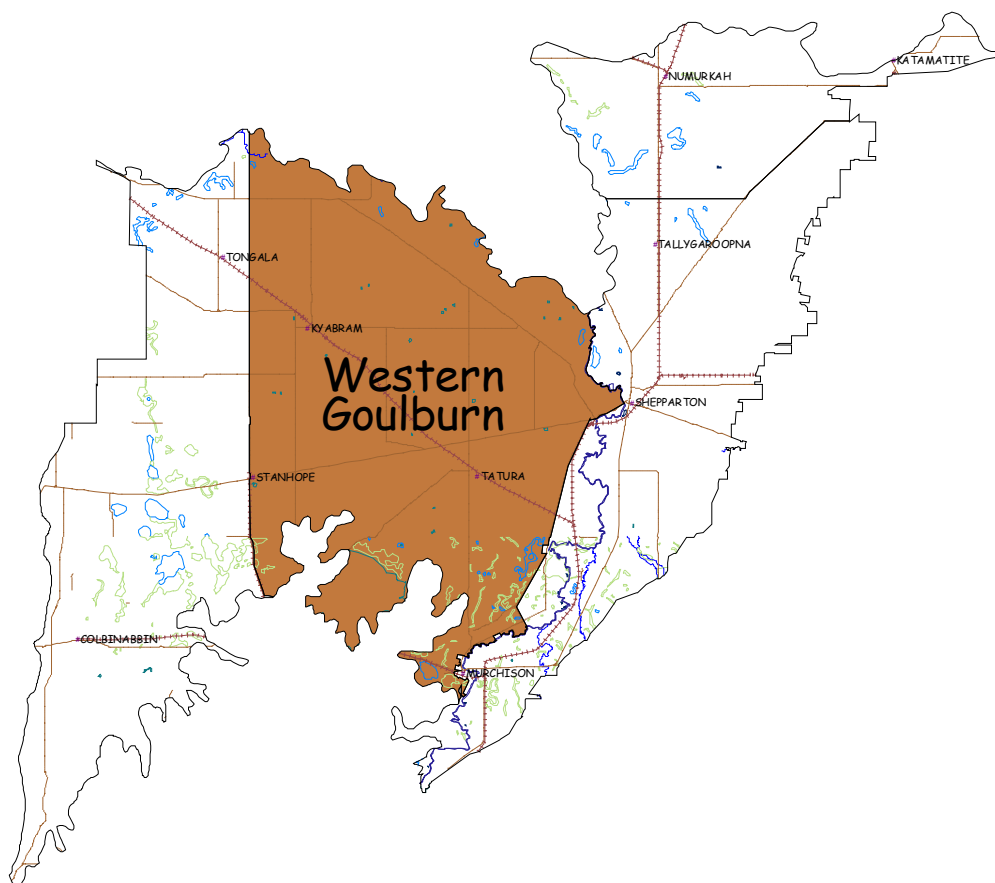


# 9. Western Goulburn Landscape Zone



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## 9. Western Goulburn Landscape Zone

### 9.1 Western Goulburn Landscape Zone description

Western Goulburn zone (123,833 ha; 20.4% of the plan area) falls entirely within the Victorian Riverina bioregion, and is bounded to the west by the Girdarre–Rushworth Road and Curr Road (extending north to Yambuna), to the north by the bioregional boundary with Murray Fans (skirting the southern margin of the Goulburn River floodplain), to the east by the Goulburn River (from Coomboona to Shepparton) and by the Midland Highway and Mooroopna–Murchison Road (Shepparton to Murchison), and to the south by the Goldfields bioregional boundary. Towns in the zone include Kyabram, Tatura, Mooroopna and Murchison, with Stanhope on the western border and Shepparton on the eastern margin. The Midland Highway is an important artery between Stanhope and Shepparton, and the Toolamba–Echuca rail line passes diagonally across the zone. Waranga Reservoir, an offstream storage of Goulburn River streamflows, is included, though most land surrounding the storage other than to the north is consigned to Goldfields bioregion (dealt with in a separate plan; see Lowe et al. 2002a). The zone is overlain mainly by Greater Shepparton Local Government Area, but includes smaller segments administered by Campaspe (in the west) and Strathbogie (in the south) (Map 11).

Western Goulburn zone lies within the Goulburn River Basin (LCC 1989) and falls less than 20 m in elevation over some 50 kms from south-east to north-west, the net direction of drainage.



Short linear remnants, dominated by Grey Box and often well-treed—such as this one in Mooroopna North—typify roadsides in Western Goulburn zone. A0158

The flatness of the zone gives rise to a somewhat indistinct drainage system with no major natural streambeds evident. Water delivery and drainage throughout the zone is via a complex and often meandering system of man-made channels and drains, connecting both with the Goulburn River irrigation system in the north and east, and the Waranga Reservoir system in the

south. The zone is uniformly comprised of quaternary alluvial sediments, forming a well-drained riverine plain, across which leveed prior streams are oriented largely from south-east to north-west (LCC 1983).

The pre-1750 vegetation coverage consisted of an extensive matrix of *plains grassy woodland* (e) overlain with broad patches of *pine box woodland / riverina plains grassy woodland mosaic* (e), the latter frequently associated with *drainage line complex* (e) vegetation (Map 23). Grey Box would have dominated the woodland EVCs throughout most of the zone. However, very few remnants of the former native vegetation have survived across these agriculturally favourable districts (Map 24). Moreover, settlement seems to have left little option for the reservation of wooded public land other than road reserves, along many of which characteristically narrow and discontinuous belts of Grey Box still persist, though usually with very degraded understorey.

## 9. Western Goulburn Landscape Zone

### 7.1 Western Goulburn Landscape Zone description (cont'd)

A scattering of wetlands formerly occurred either side of Rushworth–Tatura Road, to the north of Waranga Reservoir site. These comprised *redgum wetland* (e), *plains grassy woodland / gilgai plain woodland / wetland mosaic* (e), *plains grassy wetland* (e), and small areas of *sand ridge woodland* (e). The reservoir site formerly supported *gilgai plain woodland / wetland mosaic* (e) surrounded by *alluvial terraces herb-rich woodland* (e) and patches of *grassy woodland* (e).

Irrigated farming is the major land use in the zone today, with dairying and mixed farming being the most widespread forms but with intensive orchard cultivation around Mooroopna, Tatura and Kyabram, where pome, stone, citrus, and vine

fruits are produced. Other local outputs are cereal crops, vegetable cultivation, fat sheep and cattle (LCC 1983).

Detailed maps showing the locations of Pre-1750 EVCs (Map 34), Current EVCs (Map 24), EVC conservation status and public land (Map 25), threatened flora (Map 27), threatened fauna (Map 26) 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 Victoria - lower case, Australia - upper case; followed by
- BNA priority / risk rankings for threatened taxa (1A, 2A, 2B, etc., or NR – not ranked).



An unusually large freehold woodlot (about 10 ha) of Grey Box on Tatura–Undera Road, Mooroopna North. A0160

## 9. Western Goulburn Landscape Zone

### 7.1 Western Goulburn Landscape Zone description (cont'd)

**Table 22. Total area of pre-1750 and extant EVCs in the Western Goulburn Landscape zone**

EVC Group	EVC Number	EVC Bioregional Conservation Status	EVC Name	Pre-1750 Area (ha)	Current Area (ha)
14	55	E	Plains Grassy Woodland	85360	615
14	867	E	Pine Box Woodland/Riverina Plains Grassy Woodland Mosaic	24780	135
15	168	E	Drainage Line Complex	2846	87
5	175	E	Grassy Woodland	1871	31
19	125	E	Plains Grassy Wetland	1724	46
15	255	D	Riverine Grassy Woodland/Riverine Sedgy Forest/Wetland Mosaic	1665	1285
14	235	E	Gilgai Plain Woodland/Wetland Mosaic	1572	0
16	67	E	Alluvial Terraces Herb-rich Woodland	894	0
14	868	E	Pine Box Woodland	676	10
13	132	E	Plains Grassland	638	1
14	294	E	Plains Grassy Woodland/Gilgai Plains Woodland/Wetland Mosaic	403	<1
19	292	E	Red Gum Wetland	384	15
19	333	E	Red Gum Wetland/Plains Grassy Wetland Mosaic	328	19
19	74	E	Wetland Formation	295	111
14	264	E	Sand Ridge Woodland	244	37
15	871	E	Riverine Grassy Woodland/Gilgai Plain Woodland/Wetland/Riverina Plains Grassy Woodland	56	0
15	68	E	Creekline Grassy Woodland	25	0
15	321	E	Black Box Chenopod Woodland/Lignum Wetland Mosaic	20	1
15	103	E	Black Box Chenopod Woodland	18	0
19	334	E	Lagoon Wetland	17	8
15	872	E	Riverine Grassy Woodland/Riverina Plains Grassy Woodland/Black Box Chenopod Woodland Complex	13	0
4	61	V	Box Ironbark Forest	4	0
<b>TOTAL</b>				<b>123833</b>	<b>2403</b>
99	997	NA	Private Land No Tree Cover	0	121431

**Table 23. Total area and number of current EVCs in each conservation status in the Western Goulburn Landscape zone.**

EVC Bioregional Conservation Status	Hectares	Number of EVCs
Endangered	1118	14
Vulnerable	0	0
Depleted	1285	1
Rare	0	0
Least Concern	0	0
Presumed Extinct	0	0

## 9. Western Goulburn Landscape Zone

### 7.1 Western Goulburn Landscape Zone description (cont'd)

**Table 24. List of current threatened flora and their conservation status in the Western Goulburn Landscape zone (as at December 2002, NRE 2002c).**

Latin Name	English Name	Australian Status	Victorian Status	FFG Listed	FFG Action Statement Number	Recovery Plan	BNA Assessed	Species number
<i>Allocasuarina luehmannii</i>	Buloke			L			Un	678
<i>Alternanthera nodiflora</i>	Common Joyweed		k				Un	185
<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass	V	k					3623
<i>Callitriche cyclocarpa</i>	Western Water-starwort	V	v					569
<i>Callitriche sonderi</i>	Matted Water-starwort		k				Un	573
<i>Craspedia canens</i>	Grey Billy-buttons		e				Un	4643
<i>Craspedia paludicola</i>	Swamp Billy-buttons		v				Un	4649
<i>Elymus multiflorus</i>	Short-awned Wheat-grass		k				Un	1583
<i>Eragrostis alveiformis</i>	Granite Love-grass		k				Un	1192
<i>Eulalia aurea</i>	Silky Browntop		r				Un	1328
<i>Hydrilla verticillata</i>	Hydrilla		r				Un	1713
<i>Juncus psammophilus</i>	Sand Rush		r				Un	1836
<i>Leptochloa fusca ssp. fusca</i>	Brown Beetle-grass		r				Un	1060
<i>Lipocarpa microcephala</i>	Button Rush		v				Un	2020
<i>Myoporum montanum</i>	Waterbush		r				Un	2240
<i>Myriophyllum striatum</i>	Striped Water-milfoil		v				Un	3869
<i>Poa fordeana</i>	Forde Poa		k				Un	2593
<i>Sclerolaena napiformis</i>	Turnip Copperburr	E	e	L	171			3991
<i>Senecio cunninghamii var. cunninghamii</i>	Branching Groundsel		k				Un	3104
<i>Sida intricata</i>	Twiggy Sida		v				Un	3143
<i>Templetonia stenophylla</i>	Leafy Templetonia		r				Un	3341

**Table 25. List of current threatened fauna and their conservation status in the Western Goulburn Landscape zone (as at December 2002, NRE 2002d).**

English Name	Latin Name	Australian Status	Victorian Status	FFG Listed	FFG Action Statement Number	Recovery Plan	BNA Assessed	Species number
Australasian Bittern	<i>Botaurus poiciloptilus</i>		e				Un	197
Australasian Shoveler	<i>Anas rhynchotis</i>		v				Un	212
Baillon's Crake	<i>Porzana pusilla</i>		v				Un	50
Bandy Bandy	<i>Vermicella annulata</i>		l	L				2734
Barking Owl	<i>Ninox connivens</i>		e	L				246
Black Falcon	<i>Falco subniger</i>		e					238
Blue-billed Duck	<i>Oxyura australis</i>		v	L				216
Brolga	<i>Grus rubicunda</i>		v	L				177
Brown Quail	<i>Coturnix ypsilophora</i>		i				Un	10
Bush Stone-curlew	<i>Burhinus grallarius</i>		e	L	78			174

## 9. Western Goulburn Landscape Zone

### 7.1 Western Goulburn Landscape Zone description (cont'd)

English Name	Latin Name	Australian Status	Victorian Status	FFG Listed	FFG Action Statement Number	Recovery Plan	BNA Assessed	Species number
Cape Barren Goose	<i>Cereopsis novaehollandiae</i>		v				Un	198
Caspian Tern	<i>Sterna caspia</i>		v				Un	112
Chestnut-rumped Heathwren	<i>Hylacola pyrrhopygia</i>		i				Un	498
Crested Bellbird	<i>Oreoica gutturalis</i>			L			Un	419
Crimson-spotted Rainbowfish	<i>Melanotaenia fluviatilis</i>		i	L				4060
Diamond Dove	<i>Geopelia cuneata</i>		v				Un	31
Diamond Firetail	<i>Stagonopleura guttata</i>			L			Un	652
Freckled Duck	<i>Stictonetta naevosa</i>		e	L	105			214
Glossy Ibis	<i>Plegadis falcinellus</i>		v					178
Golden Perch	<i>Macquaria ambigua</i>		v					4095
Great Egret	<i>Ardea alba</i>		e	L				187
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>		e	L	34			443
Gull-billed Tern	<i>Sterna nilotica</i>		e				Un	111
Hardhead	<i>Aythya australis</i>		v				Un	215
Hooded Robin	<i>Melanodryas cucullata</i>			L			Un	385
Intermediate Egret	<i>Ardea intermedia</i>		c	L				186
Little Bittern	<i>Ixobrychus minutus</i>		e					195
Little Egret	<i>Egretta garzetta</i>		c					185
Long-toed Stint	<i>Calidris subminuta</i>		i				Un	965
Magpie Goose	<i>Anseranas semipalmata</i>		e				Un	199
Murray Cod	<i>Maccullochella peelii peelii</i>		v	L				4094
Musk Duck	<i>Biziura lobata</i>		v				Un	217
Nankeen Night Heron	<i>Nycticorax caledonicus</i>		v					192
Painted Honeyeater	<i>Grantiella picta</i>		v	L			Un	598
Painted Snipe	<i>Rostratula benghalensis</i>		e					170
Pied Cormorant	<i>Phalacrocorax varius</i>		l				Un	99
Powerful Owl	<i>Ninox strenua</i>		e	L	92		Un	248
Red-backed Kingfisher	<i>Todiramphus pyrrhopygia</i>		v				Un	325
Regent Honeyeater	<i>Xanthomyza phrygia</i>	E	c	L	41	Y	Un	603
Royal Spoonbill	<i>Platalea regia</i>		v					181
Speckled Warbler	<i>Chthonicola sagittata</i>		v				Un	504
Square-tailed Kite	<i>Lophoictinia isura</i>		e				Un	230
Squirrel Glider	<i>Petaurus norfolcensis</i>		e	L	166			1137
Superb Parrot	<i>Polytelis swainsonii</i>	V	e	L				277
Swift Parrot	<i>Lathamus discolor</i>	E	e	L	169	Y		309
Tree Goanna	<i>Varanus varius</i>		i				Un	2283
Turquoise Parrot	<i>Neophema pulchella</i>		l	L				302
Warty Bell Frog	<i>Litoria raniformis</i>	V	v				Un	3207
Whiskered Tern	<i>Chlidonias hybridus</i>		l				Un	110
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>		e	L	60			226
Woodland Blind Snake	<i>Ramphotyphlops proximus</i>		v					2603

## 9. Western Goulburn Landscape Zone

### 9.2 Western Goulburn Landscape Zone priorities

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#### 9.2.1 Summary of priority biodiversity actions for Western Goulburn Landscape zone

- Protect and enhance native vegetation communities within Gemmill Swamp and Doctors Swamp Wildlife Reserves (C17, C14 respectively), and conserve threatened flora and fauna taxa which these reserves support.
- Ensure that all State Forest (SPZ and SMZ) in the zone [being identified by Todd (1999) and by Robinson (1998b) as 'priority' areas for conservation and / or reservation, and included within a nationally significant site and the Goulburn River *Heritage River* overlay] is managed so as to fully protect existing biodiversity values and potential, and is carefully reviewed as to the adequacy of its current tenure to provide long-term protection from the threat of timber harvesting or domestic grazing, or both.
- 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 Gemmill Swamp and Doctors Swamp Wildlife Reserves; State Forest within Goulburn River *Heritage River* zone; Waranga Basin (\*D50 / D55) buffer land; roadside vegetation on Murray Valley Highway near Wyunga and rail reserve at Kyabram.
- Protect significant roadside vegetation on Murray Valley Highway near Wyunga, and other roadside remnants having potential or known biodiversity value or significance.
- Identify localised sites of high biodiversity value and provide appropriate protection and management. Select the most strategic sites around which to develop Local Area Plans, where appropriate. These plans would use vegetation restoration to expand and extend existing remnants across tenures, for the most effective biodiversity outcome. Priority sites include Gemmill Swamp and Doctors Swamp Wildlife Reserves, State Forest within Goulburn River *Heritage River* zone; Waranga Basin (\*D50 / D55) buffer land, buffer land; roadside vegetation on Murray Valley Highway near Wyunga, and rail reserve at Kyabram.

## 9. Western Goulburn Landscape Zone

### 9.3 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. Freehold in the zone is generally heavily cleared, as typically occurs where intensive agriculture is pursued (mostly under irrigation) on the fertile riverine plain. As on roadsides, Grey Box tends to dominate the plain remnants, of which very few retain areas of more than a few hectares. Some recent attempts to retain or even restore woodlot-style remnants are evident (e.g. around Tatura). A common practice in the district appears to have been to retain native trees (predominantly Grey Box) as shelter close to the homestead, however these remnants (at least the understorey layers) are mostly highly degraded due to domestic farm activities.

#### **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 Vic - lower case, Aust - upper case; followed by BNA priority / risk rankings for threatened taxa = 1A, 2B, etc., or un - unassessed):

**EVCs:** Pre-1750 vegetation cover on land of this tenure was mainly *plains grassy woodland* (e), *pine box woodland* (e) and *pine box woodland / riverina plains grassy woodland mosaic* (e). However, shallow swamps and depressions supported many other localised wetland EVCs, including *drainage line complex* (e) and *plains grassy wetland* (e). River Red Gum would have predominated in these areas subject to regular inundation. Grazing and landscape changes relating to irrigation have ensured that very few remnants of these vegetation types are now evident within the zone.

**Threatened flora:** Turnip-fruit Copperburr (Ee, unr), Western Water-starwort (Vv, unr).

**Threatened fauna:** Australasian Bittern (e, unr), Barking Owl (e, 2A), Black Falcon (e, 1A), Blue-billed Duck (v, 4B), Bush Stone-curlew (e, 1A), Brolga (v, 2B), Freckled Duck (e, unr), Glossy Ibis (v, 3B), Great Egret (e, unr), Grey-crowned Babbler (e, 2A), Intermediate Egret (cen, 1A), Little Egret (cen, 1A), Nankeen Night Heron (v, 1B), Painted Snipe (e, 1A), Royal Spoonbill (v, 1B), Squirrel Glider (e, 3A), Superb Parrot (Ve, unr), Swift Parrot (Ve, 1A), Turquoise Parrot (In, 3C), White-bellied Sea-eagle (e, unr), Woodland Blind Snake (v, 1B).



Painted Snipe (Photo: Mike Carter)

## 9. Western Goulburn Landscape Zone

### 9.3 Private Land (cont'd)

#### Recommended actions:

#### Protection of existing remnants:

- Identify and protect significant freehold remnants, giving priority to sites retaining significant remnants or native vegetation under regeneration. Apply voluntary programs, incentives and/or planning controls, as appropriate, to protect biodiversity values.
- Give secondary priority to significant remnants in close proximity to sites identified as significant or *high-value* on other tenures in the zone, such as roadsides.
- 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 retain remnants, or which connect with or extend existing remnants.
- Adhere strictly to native vegetation retention controls, focusing particular effort on retaining large trees and woodlots near sites used by threatened woodland taxa.
- Assist LGAs to include any priority freehold remnants having strategic connective value or potential with roadside conservation plans.
- Ensure that Shire staff know locations and importance of freehold remnants having existing or potential biodiversity value.
- Assist landholders to identify funds 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):

- Exclude domestic grazing to benefit Intermediate Egret (4).
- Enhance flow regimes to benefit Australasian Bittern (2) Freckled Duck (2), Glossy Ibis (1), Great Egret (2), Little Egret (4), Royal Spoonbill (3), and White-bellied Sea-eagle (2).
- Supplement riparian habitats to benefit Blue-billed Duck (1), Nankeen Night Heron (3) and Royal Spoonbill (3).
- Increase the abundance of mature woodland trees, conserve native understorey, exclude grazing and improve woodland connectivity, to benefit Superb Parrot (4).
- Supplement woodland habitats and control introduced predators to benefit Bush Stone-curlew (4).



Royal Spoonbill (Photo: Peter Menkhorst)

## 9. Western Goulburn Landscape Zone

### 9.3 Private Land (cont'd)

- Supplement woodland habitats, exclude domestic grazing, and control introduced predators to benefit Grey-crowned Babbler (4), Painted Snipe (4), Squirrel Glider (3) and Turquoise Parrot (1).
- Supplement woodland habitats and grasslands to benefit Black Falcon (4).
- Supplement woodland habitats and exclude domestic grazing to benefit Woodland Blind Snake (3).
- Conserve understorey shrubs and trees in woodland stands to benefit Barking Owl (3).
- Enhance flow regimes to benefit Crimson-spotted Rainbowfish (2), Golden Perch (2), and Murray Cod (2).
- Exclude domestic grazing, and control introduced predators, to benefit Brolga (2).
- Modify stocking levels as appropriate, and control weeds, to benefit Turnip-fruit Copperburr (2) and Western Water-starwort (2).
- Enhance flow regimes to benefit Western Water-starwort (2).

#### Restoration of strategic vegetation blocks or linkages:

- Encourage and assist regeneration and consolidation of freehold remnants, giving priority to *higher value* sites (that is, larger / better condition).
- 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 (e.g. near State Forest or Wildlife Reserve).
- Encourage landholder participation (through Local Area plans) to establish habitat linkages within and between the better-quality freehold remnants described above.
- Arrange (in consultation with licensees) to fence out key unused roads and creeklines.
- Urge 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.
- On freehold land abutting roadside habitats of Grey-crowned Babbler or Woodland Blind Snake, 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 CMA, develop habitat management plans for streamsides on freehold, with particular emphasis upon protecting and expanding habitat nodes (e.g. creekline-roadside intersects).

## **9. Western Goulburn Landscape Zone**

### **9.3 Private Land (cont'd)**

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**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 – 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 – Freckled Duck (105).
- FFG Action Statement – Squirrel Glider (166).
- FFG Action Statement – Swift Parrot (169).
- FFG Action Statement – Turnip Copperbur (171).
- CAMBA – Great Egret, Painted Snipe, White-bellied Sea-eagle, Glossy Ibis.
- JAMBA – Great Egret.
- Management Plan – Brolga (Arnol et al. 1984).
- Management Plan – Superb Parrot (Webster & Ahern 1992).
- Recovery Plan – Swift Parrot (SPRT 2000).

## 9. Western Goulburn Landscape Zone

### 9.4 Water Production

#### **Land Tenure Details:**

The tenure is represented in the zone only by Waranga Basin (\*D50 / D55; 6068 ha), which is an off-stream irrigation storage supplied from Goulburn Weir. Domestic water for the township of Rushworth is drawn from this storage, which also has a flood mitigation role. In addition, it provides recreational and sporting opportunities, and is required to be managed for its fisheries values (LCC 1985).

#### **Land Manager:**

Rural Water Authority, DSE, DPI

#### **Stakeholders:**

Key DSE, DPI, CMA

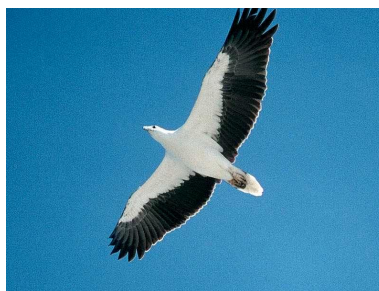
Other LGA, FNC, BG, TSN, PV, VAA

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

**EVCs:** The land within the boundary of Waranga Basin storage formerly supported *gilgai plain woodland / wetland mosaic* (e) surrounded by *alluvial terraces herb-rich woodland* (e) and patches of *grassy woodland* (e). Neither of these EVCs was represented elsewhere in the entire plan area. Both have now been obliterated by inundation.

**Threatened flora:** None recorded.

**Threatened fauna:** Grey-crowned Babbler (e, unr), Great Egret (e, unr), Swift Parrot (Ve, unr), White-bellied Sea-eagle (e, unr).



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

#### **Recommended actions:**

#### **Protection of existing remnants:**

- Maintain status of D50 / D55, to conserve and enhance wetland habitat values for flora, fish and waterbirds whilst providing for recreation and water supply purposes.

## **9. Western Goulburn Landscape Zone**

### **9.4 Water Production (cont'd)**

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

- Enhance wetland regimes, providing seasonally natural water levels, to benefit Great Egret (2), White-bellied Sea-eagle (2).
- Supplement buffer habitat to provide nest trees and feeding sites for Great Egret (2) and White-bellied Sea-eagle (2).
- Increase availability of mature woodland trees on buffer land to benefit Grey-crowned Babbler (2) and Swift Parrot (2).
- Control introduced predators to benefit Grey-crowned Babbler (2).

#### **Restoration of strategic vegetation blocks or linkages:**

- Encourage collaboration with adjoining landholders to restore connectivity via creekline and other remnants.

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

- 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 – Predation by Cat (80).
- FFG Action Statement – Swift Parrot (169).
- JAMBA – Great Egret.
- CAMBA – Great Egret, White-bellied Sea-eagle.
- Recovery Plan – Swift Parrot (SPRT 2000).

## 9. Western Goulburn Landscape Zone

### 9.5 State Forest

#### **Land Tenure Details:**

The tenure includes State Forest along the Goulburn River floodplain, between Shepparton and Coomboona. All are tentatively zoned Special Management Zone (103/02) except for several small patches zoned Special Protection Zone (103/01, 103/06) (NRE 2001). The tenure falls entirely within the *Heritage River* overlay along the Goulburn River (LCC 1991, NRE 1997) and is included in the Lower Goulburn River Floodplain, which is a listed site (VIC052) in *A Directory of Important Wetlands in Australia* (EA 2002a). Robinson (1998b) included State Forest of this zone in his 'Lower Goulburn River forests' site—proposed as a 'priority for nature conservation reservation and management in the eastern northern plains'. Todd (1999) included State Forest of this zone (with other State Forest along the Goulburn) as 'priority areas for protection and establishment of protected areas' in the context of his 'Riverina' bioregion.

#### **Land Manager:**

Forests Service

#### **Stakeholders:**

Key PV, DSE, DPI, CMA

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

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

**EVCs:** The pre-1750 vegetation on this tenure was largely *riverine grassy woodland / riverine sedgy forest / wetland mosaic* (d), most of which still remains, though now in a degraded state.

**Threatened flora:** None recorded.

**Threatened fauna:** Nankeen Night Heron (v, 3B), Swift Parrot (Ve, unr), White-bellied Sea-eagle (e, 4A).



Nankeen Night Heron (Photo: Viridans Biological Databases)

#### **Recommended actions:**

##### **Protection of existing remnants:**

- Protect habitat condition and connectivity of State Forest blocks in the zone, giving priority to the Special Protection Zone remnants identified above (Land tenure).

## **9. Western Goulburn Landscape Zone**

### **9.5 State Forest (cont'd)**

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**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 in forest wetlands to benefit White-bellied Sea-eagle (2).
- Supplement riparian habitat to benefit Nankeen Night Heron (1).
- Supplement woodland habitats within State Forest to increase abundance of mature trees suitable for Swift Parrot (2).

**Restoration of strategic vegetation blocks or linkages:**

- Encourage neighbouring landholders to retain and enhance freehold remnants adjoining or close to State Forest, giving priority to locations where this effort would be most likely to benefit designated 'priority areas' described above, and sites listed for their national significance.

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

- FFG Action Statement – White-bellied Sea-eagle (60).
- FFG Action Statement – Swift Parrot (169).
- CAMBA – White-bellied Sea-eagle.
- Recovery Plan – Swift Parrot (SPRT 2000).
- Draft management plans for Heritage Rivers (NRE 1997).
- Mid-Murray FMA Proposed Forest Management Plan (NRE 2001).

## 9. Western Goulburn Landscape Zone

### 9.6 Other State Government

#### **Land Tenure Details:**

The tenure includes all unused roads, the Toolamba–Echuca Rail Reserve and the Midland Highway road reserve, as well as several Recreation Reserves (O4), Other Reserves & Public Land at Byrneside (U31; 2 ha) recommended by LCC (1985) for revegetation as a Bushland Reserve, Utility Reserves (S10, 12) and Agriculture Reserves (Q1 & 2 for Research; Q9 for alienation). The size and quality of native vegetation remnants associated with this tenure are generally poor.

#### **Land Manager:**

Land Victoria, Public Transport Corporation, VicRoads

#### **Stakeholders:**

Key DSE, DPI, CMA

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

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

**EVCs:** Vegetation types formerly (pre-1750) on land in this tenure included (predominantly) *plains grassy woodland* (e), *pine box woodland* (e) and *pine box woodland / riverina plains grassy woodland mosaic* (e). Today, these EVCs are all largely cleared in this tenure, apart from sporadic small patches.

**Threatened flora:** Turnip-fruit Copperburr (Ee, unr).

**Threatened fauna:** Bandy Bandy (In, unr), Glossy Ibis (v, unr), Woodland Blind Snake (v, unr).



Bandy Bandy (Photo: Peter Robertson)

#### **Recommended actions:**

##### **Protection of existing remnants:**

- Ensure Toolamba–Echuca Rail Reserve supporting Bandy Bandy, Glossy Ibis and Woodland Blind Snake at Kyabram is adequately protected from disturbance, and that PTC is aware of these biodiversity values.
- Ensure Turnip-fruit Copperburr is adequately protected beside Murray Valley Highway near Wyunga, and that VicRoads is aware of these biodiversity values.
- Propose Public Authority Management Agreements if appropriate.

## 9. Western Goulburn Landscape Zone

### 9.6 Other State Government (cont'd)

- 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.
- Ensure that all fenced and ungrazed (or simply 'less disturbed') unused roads remain so.
- Assess remaining requirements for revegetation on U31 at Byrneside.

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

- Install signs, control weeds and limit domestic stocking levels as appropriate to benefit Turnip-fruit Copperburr (2) beside Murray Valley Highway near Wyunga.
- Control introduced predators at Kyabram to benefit Bandy Bandy (2).
- Supplement woodland habitat, maintain ground cover and connectivity, and exclude domestic grazing to benefit Woodland Blind Snake (2) and Bandy Bandy (2).
- Enhance flow regimes to benefit Glossy Ibis (2).



*Sclerolaena napiformis* (Photo: John Eichler)

#### **Restoration of strategic vegetation blocks or linkages:**

- Investigate the need for regeneration or revegetation works as necessary to expand and restore former native vegetation communities on and near rail reserve at Kyabram and along Murray Valley Highway near Wyunga, and encourage and assist adjacent land managers to retain or restore connecting remnants.
- In consultation with licensees, improve habitat quality and connectivity of unused roads.
- Determine whether further works are needed in revegetation of U31.

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

- FFG Action Statement – Turnip Copperbur (171).
- CAMBA – Glossy Ibis.

## 9. Western Goulburn Landscape Zone

### 9.7 Local Government

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#### **Land Tenure Details:**

The tenure includes municipal roadsides and township land (T1) throughout the zone. Roadside remnants across much of the riverine plain in this zone are dominated by Grey Box. These remnants tend to persist only in short strips (< 100 m) except where supplemented by adjacent freehold remnants. Understorey on roadsides is generally invaded with weeds, especially pasture species. Connectivity of roadsides improves somewhat nearer to Goulburn River floodplain.

#### **Land Manager:**

Local Government Authority

#### **Stakeholders:**

Key DSE, DPI, CMA, PV

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

**Threatened Biodiversity Assets** (in brackets: Cons status Vic - lower case, Aust - upper 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 included *plains grassy woodland* (e), *pine box woodland* (e) and *pine box woodland / riverina plains grassy woodland mosaic* (e). Roadside remnants of these EVCs today are generally inadequate to provide for their long-term conservation in the zone.

**Threatened flora:** Turnip-fruit Copperburr (Ee, 1A), Western Water-starwort (Vv, unr).

**Threatened fauna:** Australasian Bittern (e, unr), Barking Owl (e, 2A), Black Falcon (e, unr), Blue-billed Duck (v, unr), Brolga (v, unr), Bush Stone-curlew (e, unr), Freckled Duck (e, unr), Glossy Ibis (v, unr), Great Egret (e, unr), Grey-crowned Babbler (e, 1A), Intermediate Egret (cen, unr), Nankeen Night Heron (v, unr), Little Egret (cen, unr), Painted Snipe (e, unr), Royal Spoonbill (v, unr), Superb Parrot (Ve, unr), Swift Parrot (Ve, unr), Squirrel Glider (e, 1A), Turquoise Parrot (In, unr), White-bellied Sea-eagle (e, unr), Woodland Blind Snake (v, unr).

## 9. Western Goulburn Landscape Zone

### 9.7 Local Government (cont'd)

#### Recommended actions:

#### Protection of existing remnants:

- Protect existing roadside remnants, giving priority to sites having mature or hollow-bearing trees and/or relatively intact understorey and ground layers.
- Provide fencing and sign-posting of any *high-quality* remnants.
- Encourage removal or control of grazing on all road reserves retaining native vegetation communities or significant components.
- Assist Shires to develop or upgrade roadside conservation plans and encourage integration with voluntary efforts (e.g. LFW) on adjacent tenures.
- Prevent removal from roadside habitats of ground litter, fallen timber, logs or dead-standing trees, which provide valuable shelter and forage resources for Bush Stone-curlew, Grey-crowned Babbler, Turquoise Parrot and Woodland Blind Snake.
- 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.
- Encourage freehold land managers to carefully consider, prior to undertaking works, the likely neighbouring effects of pasture improvement on remnant native flora of roadsides.



Turquoise Parrot (Photo: Len Robinson)

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

- Enhance flow regimes to benefit Australasian Bittern (2), Freckled Duck (2), Glossy Ibis (2), Intermediate Egret (2), Little Egret (2) Royal Spoonbill (2), Western Water-starwort (2) and White-bellied Sea-eagle (2), Great Egret (2).
- Exclude domestic grazing to benefit Brolga (2), Intermediate Egret (2), Turnip-fruit Copperburr (4), Turquoise Parrot (2) and Woodland Blind Snake (2).
- Increase availability of mature woodland trees to benefit Grey-crowned Babbler (4), Squirrel Glider (4), Superb Parrot (2) and Swift Parrot (2).
- Control introduced predators at known or likely habitat of Brolga (2), Bush Stone-curlew (2), Grey-crowned Babbler (4), Painted Snipe (2), Squirrel Glider (4) and Turquoise Parrot (2).
- Increase availability of understorey shrubs and trees in woodland, and exclude domestic grazing, to benefit Barking Owl (3).



Barking Owl (Photo: Viridans Biological Databases)

## 9. Western Goulburn Landscape Zone

### 9.7 Local Government (cont'd)

- Exclude human disturbance to benefit Great Egret (2).
- Supplement habitat to benefit Blue-billed Duck (2), Great Egret (2), Nankeen Night Heron (2) and Painted Snipe (2).
- Retain woodland stands, and fallen timber in understorey, to benefit Bush Stone-curlew (2), Turquoise Parrot (2) and Woodland Blind Snake (2).
- Supplement natural grassland and woodland habitats to ensure suitable hunting habitat and availability of trees for nesting and roosting, to benefit Black Falcon (2).
- Control weeds to benefit Turnip-fruit Copperburr (4) and Western Water-starwort (2).
- Install signage to benefit Turnip-fruit Copperburr (4).

#### Restoration of strategic vegetation blocks or linkages:

- Encourage and assist regeneration and consolidation of significant roadside remnants.
- Extend and expand 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.

#### 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 – 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 – Freckled Duck (105).
- FFG Action Statement – Squirrel Glider (166).
- FFG Action Statement – Swift Parrot (169).
- FFG Action Statement – Turnip Copperbur (171).
- CAMBA – Great Egret, Painted Snipe, White-bellied Sea-eagle, Glossy Ibis.
- JAMBA – Great Egret.
- Management Plan – Brolga (Arnol et al. 1984).
- Management Plan – Superb Parrot (Webster & Ahern 1992).
- Recovery Plan – Swift Parrot (SPRT 2000).



Brolga (Photo: DSE/McCann)

## 9. Western Goulburn Landscape Zone

### 9.8 Parks and Reserves

#### **Land Tenure Details:**

The zone contains only two conservation reserves. Doctors Swamp Wildlife Reserve (\*C14; 263 ha), at Murchison, contains a shallow River Red Gum freshwater wetland with valuable habitat for waterbirds, as well as Yellow Gum-Grey Box woodland (LCC 1981). It also supports a population of Grey-crowned Babblers, and is recommended by Robinson (1998b) as a 'priority for conservation reservation and management in the eastern northern plains'. Gemmill Swamp Wildlife Reserve (C17; 173 ha), a semi-permanent freshwater wetland, adjoins the Goulburn River, near Shepparton. It supports reed-bed swamps dominated by River Red Gum, with some Yellow Box also present (LCC 1985). Gemmill Swamp Wildlife Reserve falls within the *Heritage River* overlay along the Goulburn River (LCC 1991, NRE 1997). Lower Goulburn River Floodplain Forest, which is listed as site VIC052 in A Directory of Important Wetlands in Australia (EA 2002a), includes Gemmill Swamp Wildlife Reserve.

#### **Land Manager:**

Parks Victoria

#### **Stakeholders:**

Key DSE, DPI, CMA

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

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

**EVCs:** \*C14 formerly supported *wetland formation* (e), flanked by *plains grassy woodland*. These EVCs, though degraded, remain present. C17 supported *riverine grassy woodland / riverine sedgy forest / wetland mosaic* (d) with patches of *pine box plains / riverina plains grassy woodland mosaic* (e). Only the former EVC remains on this reserve.

**Threatened flora:** None recorded.

**Threatened fauna:** Blue-billed Duck (v, 2B), Brolga (v, unr), Glossy Ibis (v, 1B), Great Egret, (e, 2A), Grey-crowned Babbler (e, unr), Murray Cod (v, 4A), Nankeen Night Heron (v, unr).



Murray Cod (Photo: DSE)

## 9. Western Goulburn Landscape Zone

### 9.8 Parks and Reserves (cont'd)

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#### Recommended actions:

#### Protection of existing remnants:

- Ensure that existing biodiversity values on C17 and \*C14 are protected and conserved. In particular, monitor status of Grey-crowned Babbler population on \*C14, and take action as necessary to avoid disturbance and sustain habitat suitability.
- Manage flooding regimes (and associated habitats) so as to equate, as far as possible, with pre-European volumes, frequencies and durations.

**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 (shallow wetlands) and supplement riparian vegetation to benefit Blue-billed Duck (2), Glossy Ibis (2), Nankeen Night Heron (2) and Royal Spoonbill (1).
- Enhance flow regimes to benefit Murray Cod (2).
- Monitor habitat of Grey-crowned Babbler (2) colonies at \*C14 and seek opportunities to enhance existing or potential habitat, including by controlling introduced predators.
- Control introduced predators at \*C14 to benefit Brolga (2).



Nankeen Night Heron (Photo: DSE/McCann)

#### Restoration of strategic vegetation blocks or linkages:

- Determine if re-establishment of flanking box woodlands is feasible at either or both reserves.
- Investigate with adjoining landholders or other land managers any options to bolster connectivity adjacent to existing remnants, especially along drainage lines, around \*C14 and C17.

## **9. Western Goulburn Landscape Zone**

### **9.8 Parks and Reserves (cont'd)**

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

- FFG Action Statement – Grey-crowned Babbler (34).
- FFG Action Statement – Predation by Red Fox (44).
- FFG Action Statement – Predation by Cat (80).
- CAMBA – Great Egret, Glossy Ibis.
- JAMBA – Great Egret.
- Management Plan – Brolga (Arnol et al. 1984).
- Draft management plans for Heritage Rivers (NRE 1997).
- ECC (2001) recommendation to redesignate \*C14 as Natural Features Reserve.