

A SURVEY OF ROADSIDE CONSERVATION VALUES IN THE SHIRE OF COOROW



AND ROADSIDE MANAGEMENT GUIDELINES



Roadside Conservation Committee Oct 1996

A survey of the roadside conservation values in the Shire of Murray and roadside management guidelines

TABLE OF CONTENTS

1.0 INTRODUCTION	1
1.1 Value of roadsides	1
2.0 ASSESSMENT PROCESS	2
2.1 Methods	2
2.2 Fieldwork	3
2.3 Scoring	4
2.4 Mapping	4
3.0 RESULTS	5
4.0 MANAGEMENT GUIDELINES	11
4.1 High Conservation Value Roadsides	11
4.1.1 Management Goal	11
4.1.2 Management Guidelines	11
4.2 Medium Conservation Value Roadsides	12
4.2.1 Management Goal	12
4.2.2 Management Guidelines	12
4.3 Low Conservation Value Roadsides	12
4.3.1 Management Goals	12
4.3.2 Management Guidelines	12
4.4 Tree Roads	12
4.5 Special Environmental Areas	13
5.0 REFERENCES CITED	14
6.0 APPENDIX 1 - Definitions of Remnant Vegetation Types	15
7.0 APPENDIX 2 - Standard Survey Sheet	16
8.0 APPENDIX 3 - Major Roads Not Surveyed	17
9.0 APPENDIX 4 - Raw Data	18

FIGURES

Figure 1: Daily maximum and minimum temperatures (C) and rainfall (mm) at Carnamah 1 (Approx 25km North-west of Coorow).	
Figure 2: Conservation values of all roadsides surveyed within the Shire of Coorow.	6
Figure 3: Conservation values of roadsides controlled by the Shire of Coorow.	7
Figure 4: Predominant landuse adjoining Shire of Coorow controlled roads.	8

MAPS

Map 1: Conservation Values of roadsides surveyed within the Shire of Coorow.	10
--	----

TABLES

Table 1: Colour codes used to depict the conservation status of roadsides.	4
Table 2: Assessment of roads vested in MRD, geographically within the Shire of Coorow. Victoria Plains.	5
Table 3: Summary of roadside conditions along Shire of Coorow controlled roads.	6

ASSESSMENT OF THE CONSERVATION VALUE OF ROADSIDE VEGETATION IN THE SHIRE OF COOROW

1.0 INTRODUCTION

The Shire of Coorow covers an area of 4245.8 km² and supports a population of approximately 1600 people. The area enjoys a mediterranean climate with an annual rainfall of approximately 390 mm, most of which occurs from August to May. Daily maximum temperatures range from the mid thirties in January to the mid-high teens in July, and minimum temperatures from the mid-high teens in February to around 7 C in July and August (Figure 1).

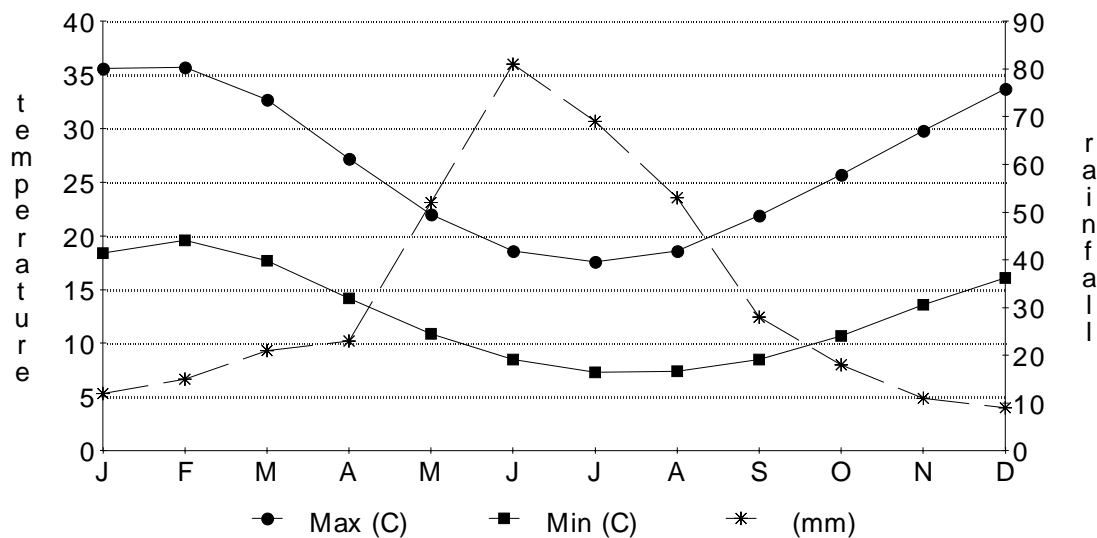


Figure 1: Daily maximum and minimum temperatures (C) and rainfall (mm) at Carnamah (Approx 25km North-west of Coorow).

The Shire of Coorow is located in the Irwin Botanical District of the South-West Botanical Province. The vegetation of the Irwin District is characterised by scrub-heath on sandplains near the coast, *Acacia-Casuarina* thickets further inland and *Acacia* scrub with scattered trees of *Eucalyptus loxophleba* on the hard-setting loams. The main vegetation systems within this shire are the Le Sueur and Marchagee Systems.

The Le Sueur System occurs over most of the **western half** of the shire. Here the vegetation comprises heath, in which blackboys (*Xanthorrhoea reflexa*) and *Dryandra* species occur on laterite, scrub heath with *Hakea obloqua* on sandy middle-slope soils containing ironstone gravel, low banksia woodland on deep sand in valley bottoms, and eucalypt woodland along major drainage lines.

The Marchagee System covers the **western half** of the shire. The principal vegetation is scrub heath of *Banksia-Xylomelum*, although there are some areas of *Allocasuarina compestris* thicket on ridges of Proterozoic rocks, and of *E. loxophleba* and *E. salmonophloia* woodland on exposed loam soils. (Beard 1981)

The district's economy is based on grain and livestock farming, a multi-million dollar fishing industry and income from tourism and holiday makers. Tourists are attracted to the area by its natural resources, such as those displayed at Mt Lesueur, Alexander Morrison and Stockyard Gully National Parks; a beautiful coastline with two well established coastal towns (Leman and Green Head); and to view the alternative farming activities such as, the growing of wildflowers, Emu Farming and the propagation of native trees and shrubs for nurseries.

1.1 Value of Roadsides

European settlement in the south-west of Western Australia has resulted in the clearing of large areas of native vegetation, with the Coorow area being no exception. In many cases, vegetated roadsides often provide the only remaining examples of more or less intact native vegetation and soil profiles.

Approximately 590 km² of shire land remains in the form of bush remnants. Of this area, 73.1% is classified as "remnant vegetation", 6.4% as "scattered trees", and 20.5% as "modified vegetation" (Beeston *et al*, 1993) note Appendix 1.

The separation of remnants by clearing, frequently results in the isolation of plant and animal populations. When populations become isolated to small reserves they are prone to food shortages, disease and reduced genetic diversity, all of which can lead to local extinction. Roadside vegetation often provides corridors between these areas and, therefore, a conduit for the movement of fauna across the landscape. The importance of conserving roadside vegetation is highlighted by the fact that approximately 78% of all bush remnants in the shire are less than 20 ha in area (Beeston *et al*, 1993). Whilst not ideal, road reserves are often all that are available as wildlife corridors.

Although limitations exist road reserves can also provide a valuable source of seed for regeneration projects. This is especially pertinent to shrub species, as grazing beneath farm trees often removes this layer. **Approval of the local shire and a CALM permit are required prior to collection.** Well vegetated roadsides are also of considerable benefit to agriculture.

They provide wind breaks to adjacent farmland, thereby providing a microhabitat more suitable to higher levels of productivity. This is due to stabilisation of temperature and the reduction of evaporation. Well conserved roadsides also assist with erosion and salinity control. Native vegetation on roadside is generally far less of a fire threat than one dominated by annual weeds.

The aesthetic value of well maintained roadsides should not be overlooked, as they have the potential to improve local tourism and provide a sense of place. As well as creating a more favourable impression of the area, roadsides attract tourists who visit the area specifically to view the wildflowers. Tourism has the potential to provide local communities with a substantial cashflow.

Roadside vegetation contributes greatly to the attractiveness of the countryside, and forms the window frame through which visitors and residents alike view the landscape.

2.0 ASSESSMENT PROCESS

2.1 Methods

The methods used to assess and calculate the conservation value of the roadside reserves are fully described in Hussey (1991) pp 41-48. The process involves scoring a set of pre-selected attributes, which, when combined, represent a roadside's conservation status. A list of these attributes is presented on a standard survey sheet (Appendix 2) to provide both a convenient and uniform means of scoring. Ideally, the survey is undertaken by a group of local volunteers, who due to their detailed knowledge of the area, are able to provide an accurate and cost effective method of data collection. Community participation also ensures a sense of 'ownership' of the end product. Which, in turn, has a much greater chance of acceptance and use by the local community and road managers.

2.2 Field Work

Fieldwork was carried out between August 1988 and February 1995 by I & B Adams, A Doley, B & V Jack, G & F Falconer, P Hussey, J & K Morcombe, J & V Muller, G Rundle, D & J Williams.

2.3 Scoring

Factors scored:

- native vegetation on roadside
- extent of native vegetation along length of roadside
- number of different native species
- weed infestation
- value as a biological indicator
- predominant adjoining land use

Each of these attributes scored from 0 to 2 points, when totalled, providing conservation values ranging from 0 to 12. In order to form a legend for mapping, conservation values were ranked into the following categories:-

- 9 - 12 high conservation value
- 7 - 8 medium - high conservation value
- 5 - 6 medium - low conservation value
- 0 - 4 low conservation value

The following attributes were also noted but did not contribute to the conservation value score:-

- width of road reserve
- width of vegetated roadside
- presence of utilities/disturbances

In addition, the assessor(s) made a subjective score of both the conservation value and landscape value of each section of road. The conservation value acts as a check for the surveyor that the data accurately reflects the visual condition of the road. The landscape value enables the assessor to express his/her opinion of the scenic quality of the road and the surrounding landscape.

2.4 Mapping

A scaled computer generated road map (GIS Arc Info) of the Coorow Shire (Map 1) depicts both the Roadside Conservation Value and Road Reserve Classification of the roads surveyed. The Conservation Values are indicated by the following colour codes (Table 1).

Table 1: Colour codes used to depict the conservation status of roadsides.

Conservation Value	Conservation Status	Colour Code
9 - 12	High	Dark Green
7 - 8	Medium-High	Light Green
5 - 6	Medium-Low	Dark Yellow
0 - 4	Low	Light Yellow

3.0 RESULTS

The conservation value of each section of roadside surveyed (Appendix 3), is presented in the following computer generated map (Map 1). This should prove to be a most useful tool for roadside management, as it enables the condition of roadside vegetation to be easily assessed for conservation values. This can then be used to identify environmentally sensitive areas to ensure their conservation, or to target degraded areas for rehabilitation or fire management. The map can also be used as a reference to overlay transparencies of other information relevant to roadside conservation. Data obtained from both CALM and the Department of Agriculture have been used to produce an overlay map which depicts the location of remnant vegetation on both state and privately owned land. This will enable the roadside vegetation to be assessed in the context of its importance to the overall conservation network within the shire. Other transparencies, such as the degree of weed infestation, or the location of environmentally sensitive areas or future planned developments, could also be produced as an aid to roadside management.

The data contained in Map 1 have been combined to provide an overview of the general condition of roadsides in the Shire of Coorow (Figure 2). However, not all of these roads are under the control of the local shire. Two roads, Brand Hwy (H4) and Moora-Dongara Rd (M28), are the responsibility of Main Roads, Western Australia (Table 2). In subsequent sections, the information relating to these roadsides will be dealt with separately to that of the shire controlled roads.

Table 2: Assessment of roads vested in MRD, geographically within the Shire of Coorow.

Road Name / No.	Conservation Value	No. of $\frac{1}{2}$ Sections	Length of Sections (l&r) (km)	Not Assessed (km)	Total Length (km)
Brand Hwy (H4)	High Medium-high Medium-low Low	2 0 0 0	68.2 0.0 0.0 <u>0.0</u> 68.2 (29.1)		29.1
Moora-Dongarra Rd (M28)	High Medium-high Medium-low Low	6 2 0 0	44.6 28.3 0.0 <u>0.0</u> 72.9 (36.45)	9.82	46.27

The results of this assessment have been passed to the MRD and these roads will not be considered further in this document.

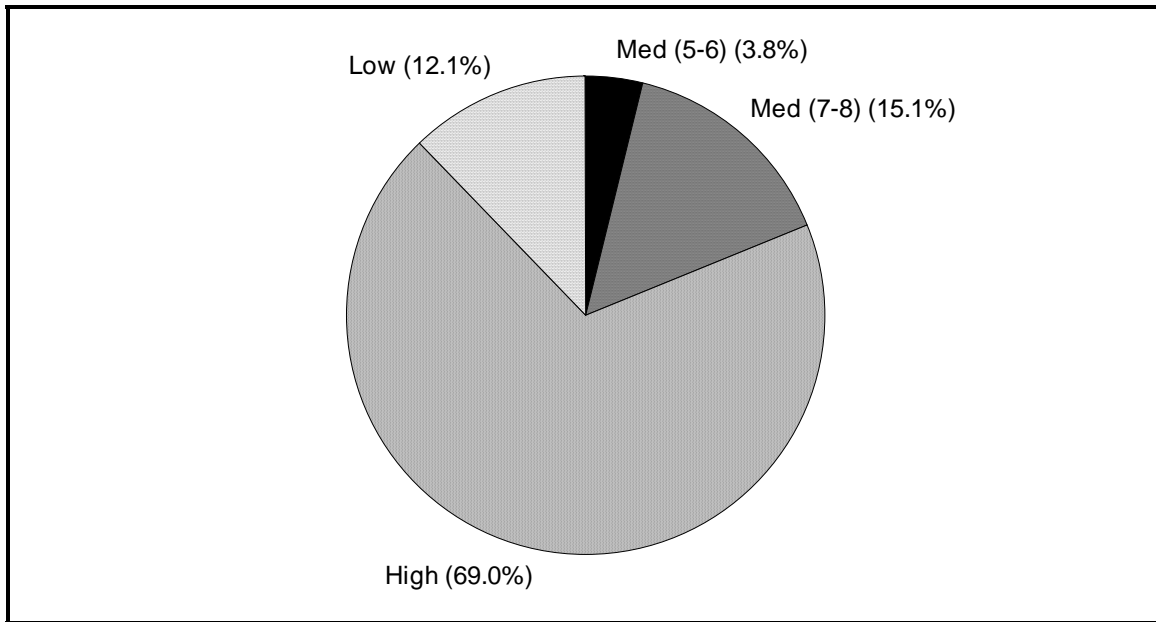


Figure 2: Conservation values of all roadsides located within the Shire of Coorow.

The results obtained for the shire controlled roads are presented in Table 3. As well as providing an overview of some of the roadside conditions in the area, this summary is useful for making comparisons with the results obtained for other shires.

Table 2: Assessment of roads vested in MRD, geographically within the Shire of Coorow.

Length of shire controlled road (km)						857.4			Conservation Value (km)		
Length of shire controlled road surveyed (km)						775.1					
Adjoining Land Use (km)			Weed Infestation (km)			High			1049.1		67.7%
						Medium			295.4		19.0%
						Low			205.6		13.3%
						Med (5-6)			64.3		4.1%
Scattered	785.3	50.7%	Medium (1)	412.7	26.6%	Med (7-8)	231.1	14.9%			
Uncleared	192.7	12.4%	Heavy (0)	306.0	19.8%		1.0	32.6	2.1%		
Other	27.6	1.8%					2.0	70.1	4.5%		
Urban	0.0	0.0%	Total	1550.1	100.1%		3.0	77.7	5.0%		
Railway	27.6	1.8%					4.0	25.3	1.6%		
Drain	0.0	0.0%					5.0	17.3	1.1%		
Plantation	0.0	0.0%	Extent of Native Vegetation (km)				6.0	46.9	3.0%		
							7.0	105.2	6.8%		
Total	1550.1	100.0%	>80%, Good (2)	830.7	53.6%		8.0	125.9	8.1%		
			20-80 % Med (1)	484.6	31.3%		9.0	197.0	12.7%		
			<20% Low (0)	234.8	15.1%		10.0	301.5	19.5%		
							11.0	382.2	24.7%		
Landscape Value (High)	697.5	45.0%	Total	1550.1	100.0%		12.0	168.3	10.9%		
						Total		1550.1	100.0%		
Number of Species (km)			Value as a Biological Corridor (km)			Native Vegetation on Roadside (km)					
Over 20 (2)	1013.6	65.4%	High (2)	1096.4	70.7%	2 - 3 veg layers	1282.0	82.7%			
6 - 19 (1)	397.9	25.7%	Medium (1)	194.6	12.6%	1 veg layer	147.9	9.5%			
0 - 5 (0)	138.6	8.9%	Low (0)	259.1	16.7%	0 veg layers	120.2	7.8%			
Total	1550.1	100.0%	Total	1550.1	100.0%	Total	1550.1	100.0%			

As the summary relates to data obtained from both the right and left hand sides of the road, roadside distances are equal to twice the actual length of road surveyed.

Areas of high conservation value were found to occupy 1049.1 km of roadside, constituting 67.7% of the length of shire controlled road surveyed (Figure 3).

Medium-high conservation value roadside accounted for 14.9% of the length surveyed, in total, covering a distance of 231.1 km (Table 3). Medium-low conservation value roadside covered 64.3 km, 4.1% of the distance surveyed. When combined, these figures indicate that 295.4 km of roadside, 19.1% of that surveyed, had medium conservation value (Table 3).

Areas of low conservation value were found to occupy 205.6 km of roadside, constituting 13.3% of the length of shire controlled road surveyed (Figure 3).

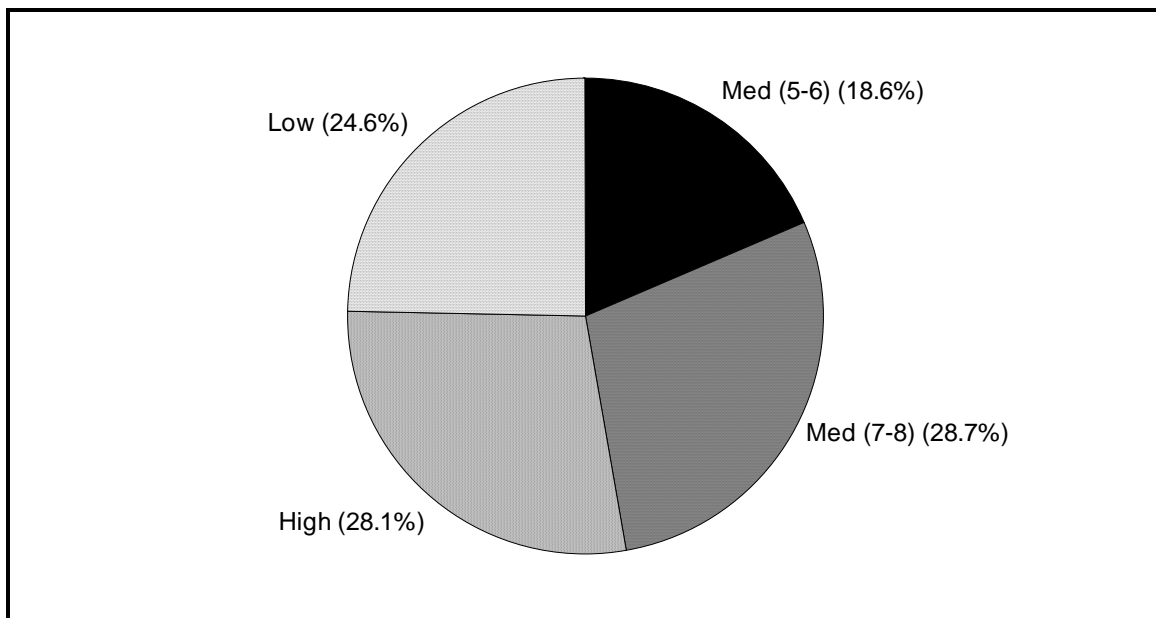


Figure 3: Conservation values of roadsides controlled by the Shire of Coorow.

The majority of land adjoining the roadsides had at least some native vegetation remaining (Figure 4). A scattered distribution of native vegetation was present along 50.7% of the roadside, 12.4% was uncleared and 35.1% was totally cleared of native vegetation. The remaining 1.8 was classified as railway reserve.

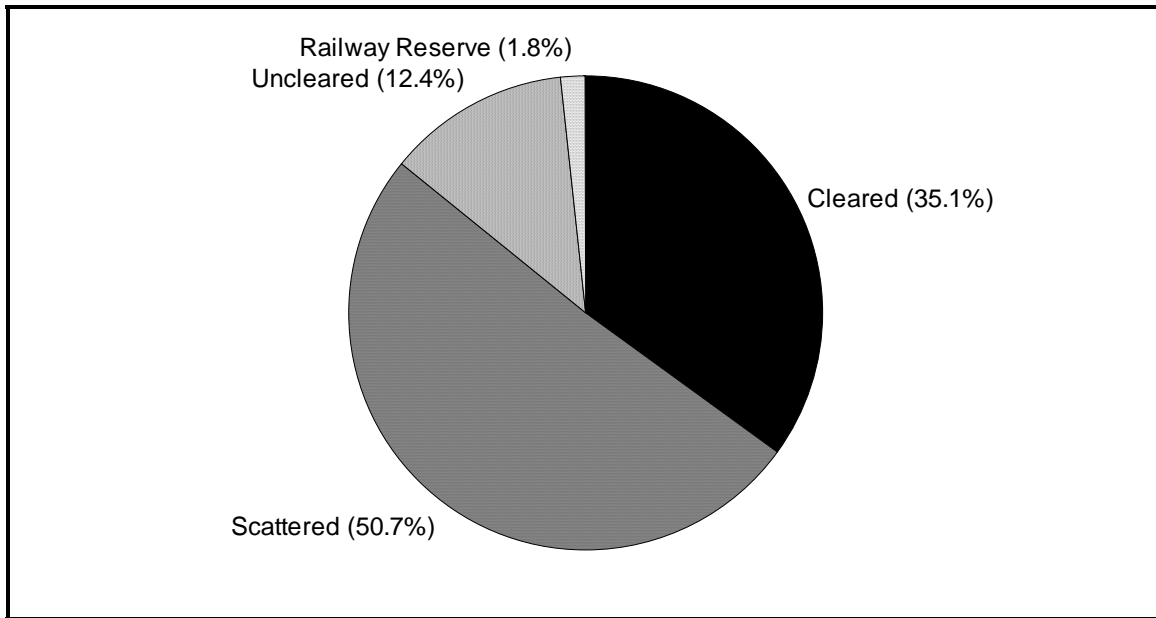


Figure 4: Predominant landuse adjoining roadsides controlled by the Shire of Coorow.

The relative importance of a roadside section as a biological corridor is dependent upon the diversity of habitat and whether it connects uncleared land. High value biological corridor was present along 70.7% of the roadside, medium along 12.6%, and low value corridor 16.7%.

Roadsides lightly affected by weeds covered 53.6% of the distance surveyed, medium level infestation, 26.6%, and heavily affected areas, 19.8% (Table 3).

Roadside with native vegetation constituting more than 80% of the vegetation present, that deemed as being in "good" condition, accounted for 53.6% of the road surveyed. Roadside with 20 to 80% native vegetation, that in "medium" condition, covered 31.3% of the road surveyed. While the remaining 15.1% had less than 20% native vegetation and, as such, was classified as being in "poor" condition (Table 3).

Survey sections with more than 20 plant species spanned 65.4% of the length of roadside surveyed. Roadside with between 6 and 19 plant species accounted for 25.7% of the distance surveyed. With the remaining 8.9% having 5 or less plant species and, therefore, no points from this attribute contributing to the conservation value scores (Table 3).

4.0 MANAGEMENT GUIDELINES

The following section of the report suggests some management techniques to help retain and enhance roadside conservation value.

These guidelines are taken from the Roadside Conservation Committee's Roadside Manual. Copies of these have been supplied to the Shire, but further copies may be obtained from the RCC on request. The Executive Officer of the Roadside Conservation Committee is available for consultation on all roadside conservation matters and can be contacted on (09) 3340423.

It is assumed that the primary aim of road management is the creation and maintenance of a safe, efficient road system. In addition, the following management procedures should be adopted.

4.1 High Conservation Value Roadsides

4.1.1 Management Goal

- **MAINTAIN AND ENHANCE THE INDIGENOUS PLANT COMMUNITIES.**

4.1.2 Management Guidelines

- **MINIMISE DISTURBANCE TO EXISTING VEGETATION.**

Because disturbance leads to weed invasion, which:-

- downgrades the conservation value;
- increases the fire threat.

Minimal disturbance can be achieved by:-

- adopting a road design that occupies the minimum space;
- diverting the line of a table drain to avoid disturbing valuable flora;
- pruning branches, rather than removing the whole tree or shrub;
- not dumping spoil on well conserved flora;
- observing dieback control measures if appropriate;
- using methods other than preventative burning to reduce fire threat;
- applying a Fire Threat Assessment (Roadside Manual chapter 9) before burning roadside;
- if roadside burning must be undertaken, incorporate it into a district fire management program;
- encouraging adjacent landholders to set back fences to allow vegetation to spread and thicken;
- encouraging adjacent landholders to plant windbreaks or farm tree lots adjacent to roadside vegetation to create a thicker belt;
- encouraging revegetation projects by adjacent landholders.

4.2 Medium Conservation Value Roadsides

4.2.1 Management Goal

- **MAINTAIN INDIGENOUS VEGETATION WHEREVER POSSIBLE, AND TO ENCOURAGE ITS REGENERATION.**

4.2.2 Management Guidelines

- **MINIMISE DISTURBANCE TO EXISTING VEGETATION.**

Consideration should be given to weed control programs, combined with reseedling/replanting local species.

4.3 Low Conservation Value Roadsides

4.3.1 Management Goals

- **RETAIN REMNANT TREES AND SHRUBS AND ENCOURAGE THEIR REGENERATION.**
- **ENCOURAGE REVEGETATION PROJECTS USING INDIGENOUS PLANTS.**

4.3.2 Management Guidelines

- **MINIMISE SOIL DISTURBANCE TO REDUCE WEED INVASION.**
- **ENCOURAGE REVEGETATION PROJECTS BY ADJACENT LANDHOLDERS.**

4.4 "Tree Roads"

"Tree roads" are defined as those roadsides with sufficient density of mature trees to create an attractive tunnel effect. Besides the aesthetic benefits, these areas also provide valuable habitat for birds and other tree dwelling species. Since mature trees are slow growing and hard to replace, care should be taken to preserve these avenues wherever possible.

- prune offending branches rather than remove the whole tree.
- cut branches off close to limb or tree trunk
- divert line of table drain to avoid disturbing tree roots.
- import fill to build up formation, rather than using side-borrow from roadside.
- if using herbicide for weed control on the roadside do not use a soil residual type, as Siomazine or Atrazine. Eucalypts are especially sensitive to these.
- encourage the adjoining landholder to plant tree belts on his property that will complement the roadside vegetation.

4.5 Special Environmental Areas

A "Special Environmental Area" is a section of the roadside which is of such great significance that it should be treated with special care when road and utility service construction or maintenance is undertaken.

Some reasons for designating a Special Environmental Area would include:

- populations of rare or endangered plants
- vegetation of special scientific, conservation or aesthetic significance
- Aboriginal or European cultural sites

So far there are five such areas have been designated within the Shire of Coorow, each of which contains a population of declared rare flora. Rare species include spiral bush (*Spirogardnera rubescens*), colourful snake bush (*Hemiandra rutilans*) and (*Calectasia arnoldii*).

6.0 APPENDIX 1

Definitions of Remnant Vegetation Types, as according to Beeston et al (1993).

Vegetation classed as "remnant vegetation" has one or more of the following characteristics (Beeston et al., 1993):

- * Most closely reflects the natural state of vegetation for a given area.
- * Has an intact understorey (if forest or woodland).
- * Has minimal disturbance by agents of human activity.

Vegetation classed as "modified vegetation" has one or more of the following characteristics:

- * Degraded understorey (ie reduction in the number of native species, includes weeds).
- * Obvious human disturbance-clearing, mining, grazing, weeds.
- * Affected by salt.
- * Narrow corridors of vegetation (usually along roads and railway lines or windbreaks), which are more likely to be affected by edge effects.

Vegetation classed as "scattered vegetation" has:

- * No understorey
- * Parkland cleared ie are scattered single trees.
- * No significant signs or chance of regeneration.

7.0 APPENDIX 2

Standard Survey Sheet

Raw Data