REGISTER OF ROAD RESERVES VALUABLE FOR FLORA CONSERVATION

Report to the Roadside Vegetation Conservation Committee

DECEMBER 1987

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INTRODUCTION

Roadside vegetation is a valuable and deteriorating resource in Western Australia. Ecologically it is important as a habitat for fauna, a migratory corridor for flora and fauna and as a source of locally adapted genetic variants which may only exist in remnant roadside areas. Roadside vegetation also has important aesthetic, educational and heritage values which contribute greatly to the tourist industry.

Recognition of the conservation importance of roadside vegetation led to the establishment of the Roadside Vegetation Conservation Committee (RVCC) in 1985 which replaced the former Road Verge Conservation Committee (1969-1983). The main function of the Committee is to coordinate and promote the conservation and effective management of rail and roadside vegetation for the benefit of the environment and the people of W.A. Recently the RVCC has been developing a system of Flora Roads - those roads which are of conservation significance because of the vegetation contained within them. These roads are to be managed under guidelines currently being developed by the RVCC.

Identification of Flora Roads has led to the need for a simple method of classifying roadside vegetation in terms of conservation value. Ideally this needed to be quick, non-technical, easily interpreted and applicable to all vegetation types in the South West Land Division of Western Australia. This report outlines a volunteer survey method designed to meet these criteria. This was run as a pilot study from September to December 1987. Owing to time constraints, the study was not as extensive as originally hoped by the RVCC.

Volunteer Surveys

The concept of a non-specialist field-based survey has been successfully applied to several Shires in Victoria (Grieves and Lloyd, 1984) and South Australia (1982). Neither methods were considered to be appropriate for volunteer assessment of W.A. roads because they were either not simplistic enough and/or were too time consuming. A more complex survey method was developed for W.A. roads (Scott, 1981). However, this requires specialist knowledge and was therefore similarly unsuitable.

The survey sheet used in this pilot study is based in principle on the Victorian design (Grieves and Lloyd) but is simplified and modified to include all variables considered relevant to the determination of roadside vegetation conservation values. It is designed to be completed by a non-specialist target group.

The decision to use volunteers in a field survey was based on the success of the recently completed Banksia Atlas. The volunteer system enables much greater coverage of Shire areas with much less time and expense per kilometre than would be possible using paid technical staff.

Conservation Value

Definitions of 'conservation value' are many and varied. Grieves and Lloyd (1984) incorporate economic and social factors as well as ecological considerations into their determination of conservation value. The South Australian model concentrates on environmental quality measured by the diversity of native species, and factors of disturbance (Mollenmans, 1982).

The definition of conservation value used here does not incorporate landscape value (aesthetic quality of road reserve) although this has been included in the survey sheet

and is also of value to managing bodies. Conservation value is interpreted as the present, intrinsic value of the roadside in terms of its vegetation and associated habitats. The current conservation value of a roadside is not affected by variables which may alter its future value such as soil type and width of roadside. These variables contribute to the stability and resilience of the roadside vegetation which cannot be effectively measured without specialist knowledge.

SURVEY METHOD

Initial Contact

The majority of volunteers were drawn from a base of approximately 400 people who had contributed to the Banksia Atlas. Additional volunteers were canvassed by publication of articles in relevant literature and by talks at various environment/conservation group meetings.

Individual Local Government Authorities (LGA) were informed of the survey by personal correspondence and by an article published in Councils West, (the publication of the Country Shire Council's Association, Western Australia) Spring 1987.

Survey Design

A sample survey sheet and accompanying pamphlet is appended to this report. A brief rationale of survey categories is outlined below:

1. Width of Vegetated Roadside

   A wider vegetated roadside usually implies less disturbance of vegetation towards the middle of the roadside.

2. Predominant Adjoining Land Use

The road reserve has greater value as a remnant habitat if it is surrounded by cleared land.

3. Native Vegetation on Roadside

Maximum value is given to road reserves where all expected strata are present (trees/shrubs/herbs). In heath areas there may only be two expected strata (shrubs/herbs).

4. No. of Different Native Species

A wider diversity of native species indicates greater habitat potential and less disturbance.

5. Extent of Native Vegetation Along Length of Roadside

A continuum of native vegetation is more valuable in terms of diversity of habitat and migration potential, than patchy conglomerates.

6. Weeds

More weeds indicates greater disturbance and lower value.

7. Dominant Soil Type

A gravel soil type usually implies greater stability than vegetation on sand.

8. Value as a Biological Corridor

Roadside vegetation which connects larger uncleared areas is of more value than isolated road reserves because of the migratory value of the roadside corridor for flora and fauna, and because larger areas provide a genetic resource base for roadside corridors. The

presence of special features also increases habitat value.

9. Utilities/Disturbances

These cause degradation of native vegetation and habitats.

10. Conservation Value

Volunteers were asked to make a subjective judgement on conservation value for double checking with the value yielded from the scoring system.

11. Landscape Value

This category is separate to the conservation category and is additional to the assessment procedure.

Volunteers were required to survey road lengths greater than 0.5 km, changing sections where the vegetation changed in quality (e.g. from few weeds to many weeds). Left and right sides were surveyed separately. The locations, roads and road lengths surveyed were selected by volunteers. This was considered a suitable approach for the pilot study. Several preliminary field trials were undertaken by volunteer groups to proof the survey sheet.

Interpretation of Data

The final assessment of survey sheets used a score system (0, 1 or 2) for six of the nine categories (see appended survey sheet). Categories not included were: width of vegetated roadside, dominant soil type, and utilities/disturbances. These were considered to be indicators of disturbance or potential disturbance rather than direct measures of conservation value.

A numeric scoring system was considered preferable to ordinal ranking because it reduces inter-category bias - all variables are assigned equal maximum and minimum values dependent on absolute contribution to conservation value rather than imputed relative importance. For example, the maximum value under predominant adjoining land use would be a score of 2 where the roadside vegetation was adjacent to completely cleared agricultural pasture. The maximum score for number of different native species would be 2 for over ten species. Hence all categories are given equal weighting. A scoring system is also a far easier and quicker interpretive method than ranking.

Presence of rare plants was not included in the determination of conservation value because recording is dependent on volunteer knowledge and also because rare plants can exist in very degraded roadsides as well as relatively undisturbed situations. There is also difficulty in determining exactly how much of an area surrounding a rare plant should be incorporated into a high conservation value category. Presence of rare plants has therefore been indicated by use of an asterisk as a superscript to the conservation value listed on the evaluation sheets.

Total values range from 0 to 12. These were used to categorise the roadside into high, medium and low conservation values as follows:

VALUE	TOTAL SCORE	MAP COLOUR
HIGH	10-12	(green)
MEDIUM	5-9	(pink)
LOW	0-4	(blue)

Presentation of Data

Data has been summarised onto separate evaluation sheets for each LGA. These list the date, observer(s), nearest named place, starting point, direction of travel, length of

section, rare plants, total scores, and conservation values for left and right sides of the road.

Conservation values were also transcribed onto LGA maps (1:100 000) to enable direct visual interpretation of roadside values. It is suggested that these be passed onto Shire authorities on completion of road surveys.

EVALUATION OF PILOT STUDY

Volunteer Response

106 people responded to requests for volunteer assistance. This represents 25.7% of the 400 volunteers originally asked. Completed survey sheets had been received from 36 volunteers by the end of December. 311 survey sheets were completed covering 36 Shires ans 128 roads over a total length of 1 100 km (Table 1).

More roads were surveyed in Denmark than in any other Shire (35 roads over a total length of 211 km). Most of the Shires surveyed are represented by 1 to 3 roads ranging from 1 km (Chittering Shire) to 73 km (Lake Grace) in surveyed length. No one Shire had all roads completely surveyed.

Shires Represented	No. Roads Surveyed	Total Length Surveyed (Km)
Albany	3	30
Beverley	1	8
Bruce Rock	2	8.5
Busselton	16	81.8
Capel	1	11
Chittering	1	1
Corrigin	1	25
Cuballing	1	35.7
Dardanup	3	8.3
Denmark	35	211.5
Donnybrook	7	40
Dundas	1	47
Gingin	2	36.4
Gnowangerup	1	11.6
Goomalling	1	14.4
Greenough	3	39.0
Jerramungup	3	104.5
Kalamunda	3	8
Kellerberrin	4	27.8
Kondinin	1	13
Lake Grace	3	73.3
Manjimup	2	9.1
Margaret River	3	3.9
Merredin	1	1.5
Morawa	11	105.2
Northampton	1	16.7
Quairading	2	9.5
Ravensthorpe	3	35.5
Tambellup	2	11
Three Springs	1	6.4
West Arthur	1	17
Westonia	1	15.6
Wongan-Ballidu	1	10.9
Yilgarn	1	52.5
York	4	23.3
TOTAL	128	1158.9

Recording of Data

Manual recording of data is tedious and information additional to that used for calculation of conservation values is still in raw form. There is need for a computerised database to be developed so that all relevant survey information can be easily transcribed onto the one system. This would allow all survey data to be readily accessed and analysed.

Completion of Survey Sheet

The majority of participants completed most of the surveyed categories adequately. Some did not complete the section on Utilities/Disturbances which was either too time consuming or poorly understood. 5 sheets were too incomplete to determine conservation values. A common problem was the listing of more than one predominant adjoining land use per road section e.g. uncleared land and completely cleared agricultural land (the mean score was taken in determining conservation value in these cases). Double listing was also common for soil type.

Checking Method

Time constraints have not permitted field checking of surveyed roads to check reliability of the scoring system and accuracy of survey design. This should be done before a longer survey is undertaken.

Internal checks comparing the conservation value assigned by the scoring system with the value listed by the volunteer yielded a positive correlation of 65% from a sample of 150 sheets.

Problems Encountered

1. Misinterpretation - some volunteers did not understand the concept of conservation value and rated roadsides

in terms of its potential for survival rather than its present intrinsic value.

2. Time constraints - this was probably the major limitation on the pilot study. Insufficient time was available for the co-ordination of volunteers, particularly in the initial contact stages of the project. Many volunteers were not able to complete survey sheets within the short period available to them.

3. Field checking - time did not permit a thorough appraisal of the reliability of data sheets in assessing the conservation value of roadside vegetation. This would require a good deal of field checking over a range of ecological types.

4. Odometer Errors - this complicates accurate mapping of roadside conservation values.

5. Border Cases - roads which have a conservation score bordering categories, particularly those with a value of 9, need cautious consideration. These may need to be re-evaluated to determine whether exclusion from a higher category is valid (perhaps using aerial photos or a more detailed field survey).

6. Management Implications - management of medium value road reserves is complicated by considerable variation in vegetation quality. In some cases the vegetation may be diverse, partly disturbed, but connect uncleared areas. Other roadsides may connect uncleared areas but be quite disturbed. An additional concern is that any road other than those with a high conservation value will be considered relatively unimportant in terms of management priority. Good management practices should not be exclusive to high value roadsides.

7. Incompleteness of survey - because roads were chosen by volunteers no Shire has had all roads completely surveyed.

SUMMARY

The pilot study has provided a useful indication of the value of volunteer involvement in field surveys of roadside vegetation. Volunteers were enthusiastic and generally completed survey sheets adequately. The survey sheet in general is adequate in providing relevant, easily interpreted information in minimal time. Some adjustments are necessary to overcome minor ambiguities and to further simplify some categories.

The pilot survey has shown the need for a more thorough study extending over a period of at least twelve months.

RECOMMENDATIONS

1. The survey should be continued during 1988.

2. Preparation period - more time should be allocated to the initial preparation period to enable more effective volunteer canvassing (articles, talks at relevant organisations and societies), and to develop a system of computerising data.

3. Volunteer training - a volunteer 'training' session should be held within each Shire for local participants to fully explain survey requirements and possibly undertake a short trial survey. It is probably valuable for the RVCC to recommend roads needing to be surveyed within each volunteer's Shire. This would reduce doubling up of surveys which would be inevitable if a large-scale survey was undertaken. Volunteers would need to be kept informed of survey progress in their Shire.

4. Field checking - current data collated from the pilot study should be subject to field checking before being submitted to Shire authorities. Ideally maps should not be submitted to Shires until complete and should be presented and discussed at individual Shire meetings, or at a central meeting with Shire representatives.

5. Survey sheet - the Survey sheet needs some modification. Dominant soil type is not well completed and could be eliminated. Utilities/disturbances could be reduced to three categories: Disturbances Continuous, Disturbances Isolated or Disturbances Absent. Further clarification of terms such as biological corridor, conservation value and predominant adjoining land use should be incorporated into the information pamphlet. The problem of odometer discrepancies may be alleviated by incorporating landmarks along each section e.g. noting road junctions, railway crossings etc.

REFERENCES

Grieves, C and D. Lloyd (1984). Conservation of roadsides and roadside vegetation. Technical Report Series No. 11. Arthur Rylah Institute for Environmental Research. Dept. of Conservation, Forests and Lands, Victoria.

Mollenmans, F. (1982). A Rapid Classification Scheme for Assessing the Conservation Significance of Roadside Vegetation. Dept. of Environment and Planning, Adelaide, South Australia.

Scott, J.K. (1981). A Survey Method for Identifying Roadside Flora Suitable for Conservation in Western Australia. Report 41. Dept. of Fisheries and Wildlife, Perth, W.A.

SURVEY TO DETERMINE THE CONSERVATION VALUE OF A ROAD

Roadside Vegetation Conservation Committee
c/- P.O. Box 104 COMO W.A. 615

Date _____ Observer(s) _____ Road Name _____
Shire _____ Nearest Named Place _____
Road Surface (sealed/unsealed) _____ Starting Point _____
Direction of Travel _____

SECTION ____
Odometer reading Start _____ End _____
Length of section ____
WIDTH OF ROAD RESERVE ____

SIDE OF THE ROAD	Left	Right
WIDTH OF VEGETATED ROADSIDE		
1-5m		
5-20m		
over 20m		

PREDOMINANT ADJOINING LAND USE

Agricultural crop or pasture		
— completely cleared	2	2
— scattered trees/shrubs	1	1
Uncleared land	0	0
Plantation of non-native trees	1	1
Urban or Industrial	1	1
Railway Reserve parallel to road	1	1
Drain Reserve parallel to road		
Other _____		

NATIVE VEGETATION ON ROADSIDE

Native trees	1	1	MAX. OF 2
Native shrubs	1	1	
Native herbs	1	1	
Rare flora known to be present	*	*	
No information on rare flora			

NO. OF DIFFERENT NATIVE SPECIES

0	0	0
1-10	1	1
Over 10	2	2

Dominant species (if known) _____

EXTENT OF NATIVE VEGETATION ALONG LENGTH OF ROADSIDE

	Left	Right
Less than 20%	0	0
20-80%	1	1
over 80%	2	2

WEEDS

Few weeds (under 20% total plants)	2	2
Half weeds (20-80% total)	1	1
Mostly weeds (over 80% total)	0	0

Dominant weeds (if known) _____

DOMINANT SOIL TYPE

Sand		
Gravel		
Limestone		
Clay		
Loam		
Other _____		

VALUE AS A BIOLOGICAL CORRIDOR

Connects uncleared areas	2	2	MAX. OF 2
Flowering shrubs for nectar-feeding animals	1	1	
Large trees with hollows for birds nests	1	1	
Hollow logs	1	1	
Waterbody (eg. stream, lake)	1	1	
Granite Outcrop	1	1	

UTILITIES/DISTURBANCES

	Left	Right
Telecom		
Main water pipeline		
Gasline		
Firebreak		
SEC		
Rest area/truck bay		
Gravel pit/sand quarry		
Evidence of recent fire		
Other _____		
Disturbances Continuous		
Disturbances Isolated		

CONSERVATION VALUE

High		
Medium		
Low		

Reasons _____

LANDSCAPE VALUE

High (Unique trees/shrubs which contrast with surrounding landscape; focal point		
Medium (similar to surrounding landscape; moderate visual interest)		
Low (sparse vegetation of little visual interest)		

GENERAL COMMENTS

SURVEY TO DETERMINE THE CONSERVATION VALUE OF A ROAD

Roadside Vegetation Conservation Committee
c/- P.O. Box 104 COMO W.A. 615

Date _____ Observer(s) _____ Road Name _____
Shire _____ Nearest Named Place _____
Road Surface (sealed/unsealed) _____ Starting Point _____
Direction of Travel _____

SECTION ____
Odometer reading Start _____ End _____
Length of section ____

WIDTH OF ROAD RESERVE ____

SIDE OF THE ROAD	Left	Right

WIDTH OF VEGETATED ROADSIDE

1-5m		
5-20m		
over 20m		

PREDOMINANT ADJOINING LAND USE

Agricultural crop or pasture		
Uncleared land		
Plantation of non-native trees		
Urban or Industrial		
Railway Reserve parallel to road		
Drain Reserve parallel to road		
Other _____		

NATIVE VEGETATION ON ROADSIDE

Native trees		
Native shrubs		
Native herbs		
Rare flora known to be present		
No information on rare flora		

NO. OF DIFFERENT NATIVE SPECIES

0		
1-10		
Over 10		

Dominant species (if known) _____

EXTENT OF NATIVE VEGETATION ALONG LENGTH OF ROADSIDE

	Left	Right
Less than 20%		
20-80%		
over 80%		

WEEDS

Few weeds (under 20% total plants)		
Half weeds (20-80% total)		
Mostly weeds (over 80% total)		

Dominant weeds (if known) _____

VALUE AS A BIOLOGICAL CORRIDOR

Connects uncleared areas		
Flowering shrubs for nectar-feeding animals		
Large trees with hollows for birds nests		
Hollow logs		

SPECIAL FEATURES

Waterbody (eg. stream, lake)		
Granite Outcrop		
Other _____		

GENERAL COMMENTS

UTILITIES/DISTURBANCES

	Left	Right
Disturbances Continuous		
Disturbances Isolated		

Disturbances Absent

CONSERVATION VALUE

High		
Medium		
Low		

Reasons _____

LANDSCAPE VALUE

High (Unique trees/shrubs which contrast with surrounding landscape; focal point		
Medium (similar to surrounding landscape; moderate visual interest)		
Low (sparse vegetation of little visual interest)		

DISTANCE CHECK

Odometer reading	Landmark

SHIRE _____

DATE	OBSERVER(S)	ROAD NAME	NEAREST NAMED PLACE	STARTING POINT	DIRECTION OF TRAVEL	LENGTH OF SECTION	RARE PLANTS	TOTAL SCORE L	TOTAL SCORE R	CONSERVATION VALUE L	CONSERVATION VALUE R