

A REMNANT VEGETATION PROTECTION SCHEME  
FOR PRIVATE FARMLAND IN WESTERN AUSTRALIA

K J Wallace, Department of Conservation and Land Management  
P O Box 100, Narrogin, WA 6312

ABSTRACT

The need to enhance soil and nature conservation by better protecting native vegetation on farmland has long been recognised. To achieve this objective in Western Australia, the State Government, in late 1988, established the Remnant Vegetation Protection Scheme.

This voluntary Scheme assists farmers to protect and manage remnants of native vegetation by providing a fencing subsidy. Farmers who accept the subsidy sign an agreement to maintain the areas as native vegetation for 30 years.

In 1988/89 110 farmers were granted the subsidy and 7 855 hectares of remnant vegetation have been protected at a cost to Government of \$290 000.

INTRODUCTION

Many government schemes have been developed which encourage private land owners to conserve natural habitat on their property. These schemes range from those which are directive, such as South Australian Heritage Agreements which are compensation based (1), to those which are entirely voluntary, for example the Victorian Conservation Trust (2).

While these schemes are generally aimed at promoting one or more of nature, soil and water conservation; some are directed towards providing recreational opportunities. Schemes in the United States which promote waterfowl breeding for hunting are an example of the latter (3).

Until 1988 the only statutory means in Western Australia of protecting natural vegetation on freehold land were:

- (a) government resumption, an approach that, apart from one or two very technical cases, has only ever been used by Water Authority of Western Australia (WAWA), to protect water catchments;
- (b) voluntary sale by landholders to government authorities;
- (c) gift to government by land-owners;
- (d) memorials registered against titles by the Commissioner of Soil Conservation, used for soil conservation purposes;
- (e) voluntary agreements made under section 16 of the Conservation and Land Management Act (1988). Such agreements have little security, and this method has never been used; and

- (24)
- (f) as a condition of subdivision imposed by the State Planning Commission.

Additional means are tax incentives which provide a primary producer with a deduction for expenditure incurred primarily for works which prevent or combat land degradation (4 cited in 5). Furthermore, funds allocated by Greening Australia and under programmes such as the National Soil Conservation Programme and State Co-operative Assistance Programme also make an important contribution to protection of natural vegetation.

A 1985 conference on the role of remnants in nature conservation (6) highlighted the importance of conserving remnant vegetation. Further impetus to protect remnants on freehold land was provided with the release of reports by the Land Resource Policy Council (7) and Coates (8). Both reports recommend a variety of ways to assist farmers protect remnant vegetation on their properties.

After consultation with the Environmental Protection Authority (EPA), WA Farmers' Federation, WA Conservation Council and Greening Australia; the Ministers for Conservation and Land Management (CALM), Water Resources and Agriculture submitted a number of recommendations to Cabinet concerning the protection of native vegetation on private land. One of these recommendations was specifically directed at encouraging farmers to protect remnant vegetation. This was that, over three years, 1.5 million dollars be allocated as a 50% fencing subsidy to encourage farmers to fence important remnants of native vegetation. Cabinet approved both this proposal and the following conditions on administration of the Scheme:

- (1) That the Scheme be administered by CALM and the Department of Agriculture, with the latter Department as lead agency.
- (2) That initial proposals of areas for financial support should come from two primary sources -
  - (i) individual farmers wishing to protect vegetation on their own land;
  - (ii) Land Conservation District Committees, who would, assisted by staff from CALM and the Department of Agriculture, provide a list in priority order for their soil conservation district of patches of vegetation for which assistance should be provided.
- (3) Both Departments promote and provide management advice towards the protection of patches of remnant vegetation throughout the State's agricultural areas.
- (4) The Scheme be reviewed at the end of the third year of its operation.
- (5) Treasury funds provided for distribution to farmers be administered by the Department of Agriculture.

The Scheme was approved by the Premier on 3 October 1988 and work began on the Scheme, titled the Remnant Vegetation Protection Scheme (RVPS), in December.

Given the directive to select "important remnants" for funding, the focus of the Scheme has been pristine, or relatively undegraded, remnants of native vegetation. Therefore the prime objective of the RVPS is to protect areas of high nature conservation value. These areas also have considerable other land and water conservation values, and thus the RVPS promotes the achievement of a range of landscape management objectives.

#### IMPLEMENTATION OF THE WA SCHEME

The procedures for selecting nominations and disbursing funds for fencing under the RVPS are described schematically in Figure 1.

The RVPS is particularly notable for its dependence on soil conservation groups, known as Land Conservation District Committees, whose membership consists mostly of farmers. Where they exist, these groups perform the important tasks of checking and ranking land-owners' nomination forms. Without this work, and that of the farmers in describing their remnant vegetation; there would be insufficient resources to run the RVPS without severely curtailing other work undertaken by CALM and the Department of Agriculture.

The RVPS was designed, organised and implemented between December 1988 and 16 June 1989. Given this tight schedule, it was inevitable that the new Scheme would suffer development problems. Also, no new staff or funds were provided to establish or run the Scheme.

Details of the Scheme's operation during 88/89 are given below in chronological sequence.

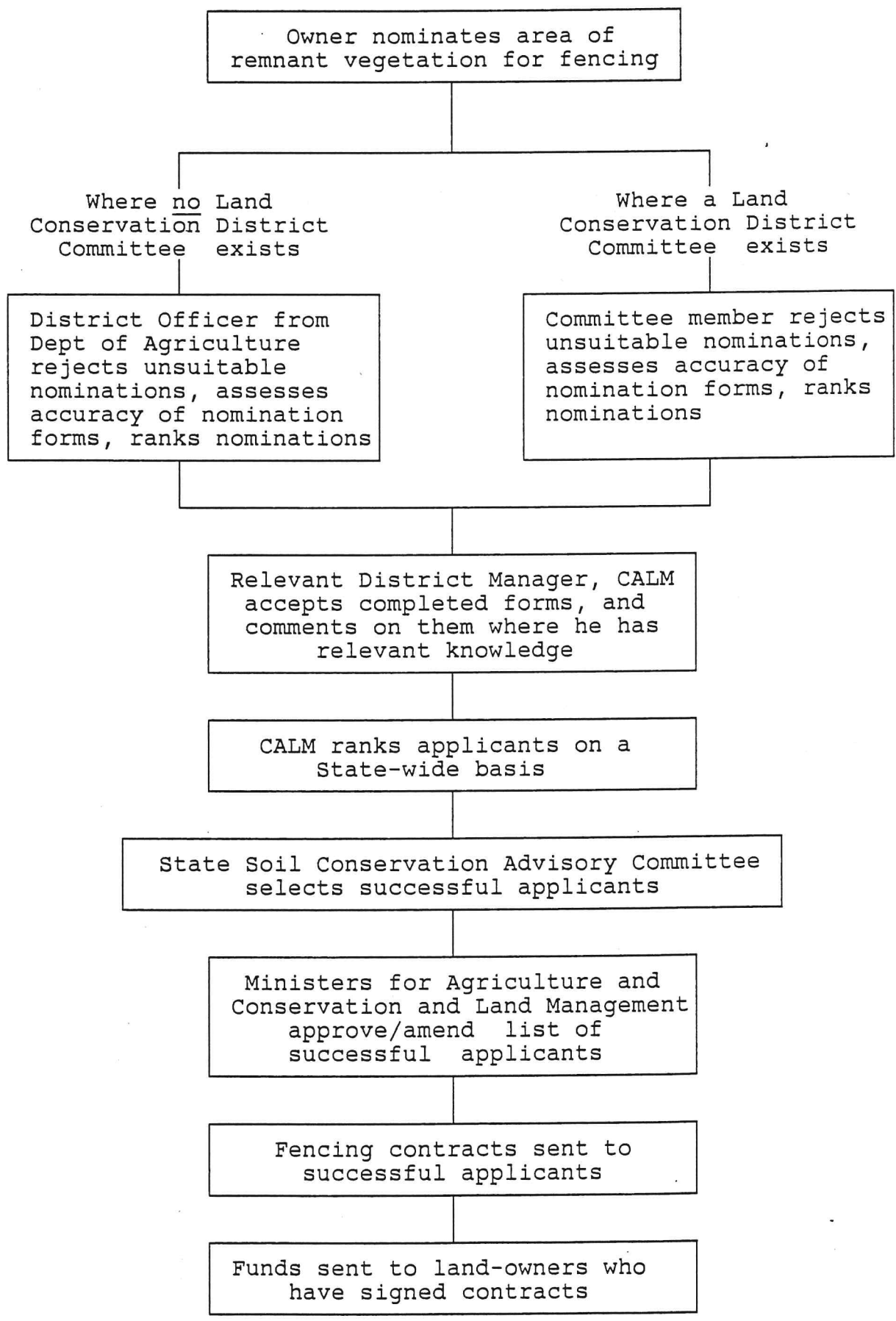
#### Design of Nomination Forms

The nomination form (Appendix 1) was designed to provide:

- (a) adequate location and ownership details for each remnant;
- (b) sufficient quantifiable information to allow remnants to be ranked according to their nature conservation value; and
- (c) an opportunity for comment concerning soil conservation value.

Given that forms were to be filled in by farmers with little or no botanical knowledge or access to people with such information, it was necessary to use characteristics which could reasonably be assessed without specialist knowledge. Four categories of questions were used to describe the nature conservation value of each remnant.

FIGURE 1: Schematic Description of Procedures for Implementing the Remnant Vegetation Protection Scheme



Firstly, is the area of sufficient size to be useful? This issue is dealt with in the first two questions on the nomination form. With decreasing remnant size, it becomes more likely that remnant areas have been degraded by exotic weeds, fertiliser drift, and other "edge effects". Also, the smaller an area, the less chance there is that viable populations of native plants and animals can be maintained. However the relatively low value of very small areas can sometimes be off-set by the presence of unusual plants and animals, particularly rare species. Five hectares was selected as the lower limit for "effective" remnant size.

Secondly, is the area degraded and to what degree? Obviously, the more degraded an area is - by, for example, mining or grazing - the less valuable it is for conservation. Question 3 of the nomination form deals with this issue. Sections 3.1 and 3.3 deal specifically with grazing and salt affected land, both difficult to quantify in comparison with other disturbances such as mining. All biologists consulted during preparation of the form agreed that the vegetation described by these criteria would have been heavily grazed or very disturbed by some other means. Some natural flooded gum (Eucalyptus rudis) and brown mallet (Eucalyptus astringens) woodlands were the only possible exceptions proposed. However, the criteria are subjective and require further research.

Thirdly, does the area contain habitats of high conservation value? This issue is addressed by Questions 4-7 on the nomination form. Vegetation types described as "Class 1" on the form are generally those with high nature conservation value, "Class 2" are of lesser value, and so on with "Class 4" habitat types being generally of least value. The nature conservation value given to each vegetation or habitat type largely reflects how well each is conserved, but other factors are also involved. For example granite outcrops are reasonably well represented on wheatbelt nature reserves, but the flora and fauna of outcrops is so varied and specialised that these habitats are accorded a higher nature conservation value than might be expected.

It should also be pointed out that some vegetation types given a low priority under this Scheme are in fact of high nature conservation value. Shrublands on lateritic uplands are an example. This vegetation type is very rich in plant species and therefore of very high nature conservation value. However, such areas are better represented on conservation reserves than, for example, wheatbelt woodlands. Consequently shrublands on laterite are given a comparatively lower value within this Scheme.

Fourthly, does the area contain known populations of plants or animals declared as rare or endangered? This question was mainly used as a criterion by which some very important small areas (less than five hectares) could be raised in value rather than omitted from consideration. In practice, only one remnant fell into this category and it will be assessed for direct funding by CALM.

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A number of other characteristics - for example, proximity to gazetted conservation areas such as nature reserves, and values as a faunal corridor - were considered for use but rejected because the questions they suggest are too complex. It was also felt that the form was already becoming too long. The original nomination form did not take into consideration regional variation in vegetation types. This issue was redressed in the assessment form, described in the following section, used by the Land Conservation District Committee (LCDC) members.

Also, a glossary of terms was written for use by nominators. However, this was not ready until assessment forms for ranking nominations were sent to LCDCs and Department of Agriculture offices.

Finally, the nomination form included space for comment concerning soil conservation and other values of the remnants. This enabled a broader range of land management values to be taken into consideration where necessary.

#### Submission of Nominations and Field Assessment

The Scheme was widely, but not intensively, advertised in the media. Nomination forms were made available through Department of Agriculture offices and secretaries of LCDCs. After completing the forms, land-owners returned them to their LCDC or, where none existed, to the nearest office of the Department of Agriculture. Committee members from LCDCs or officers from the Department of Agriculture then checked nominations and ranked them on a local basis. Individuals checking nominations were expected to have first hand knowledge of the remnants in question.

To assist those ranking nominations, and to amend errors in the original nomination form, a special assessment form was provided for each of the four regions (Figure 2) defined for the project. Copies of these forms are given in Appendix 2.

Note that cost effectiveness of fencing and relative soil conservation value were given more emphasis at this stage. The people ranking nominations were informed that:

"For habitats of both equivalent nature conservation value and condition (in terms of degradation); then remnant size, value for soil conservation, and cost effectiveness of fencing are used to decide priorities. It can be assumed that if two areas are equivalent in all respects but size, then the larger is the more valuable. Similarly, in other cases where nature conservation values are equivalent, the greater an area's value for soil conservation, or the more cost effective the fencing required, then the higher its value under this Scheme."  
(Extract from a letter to LCDCs and District Officers of the Department of Agriculture written by the Commissioner of Soil Conservation).

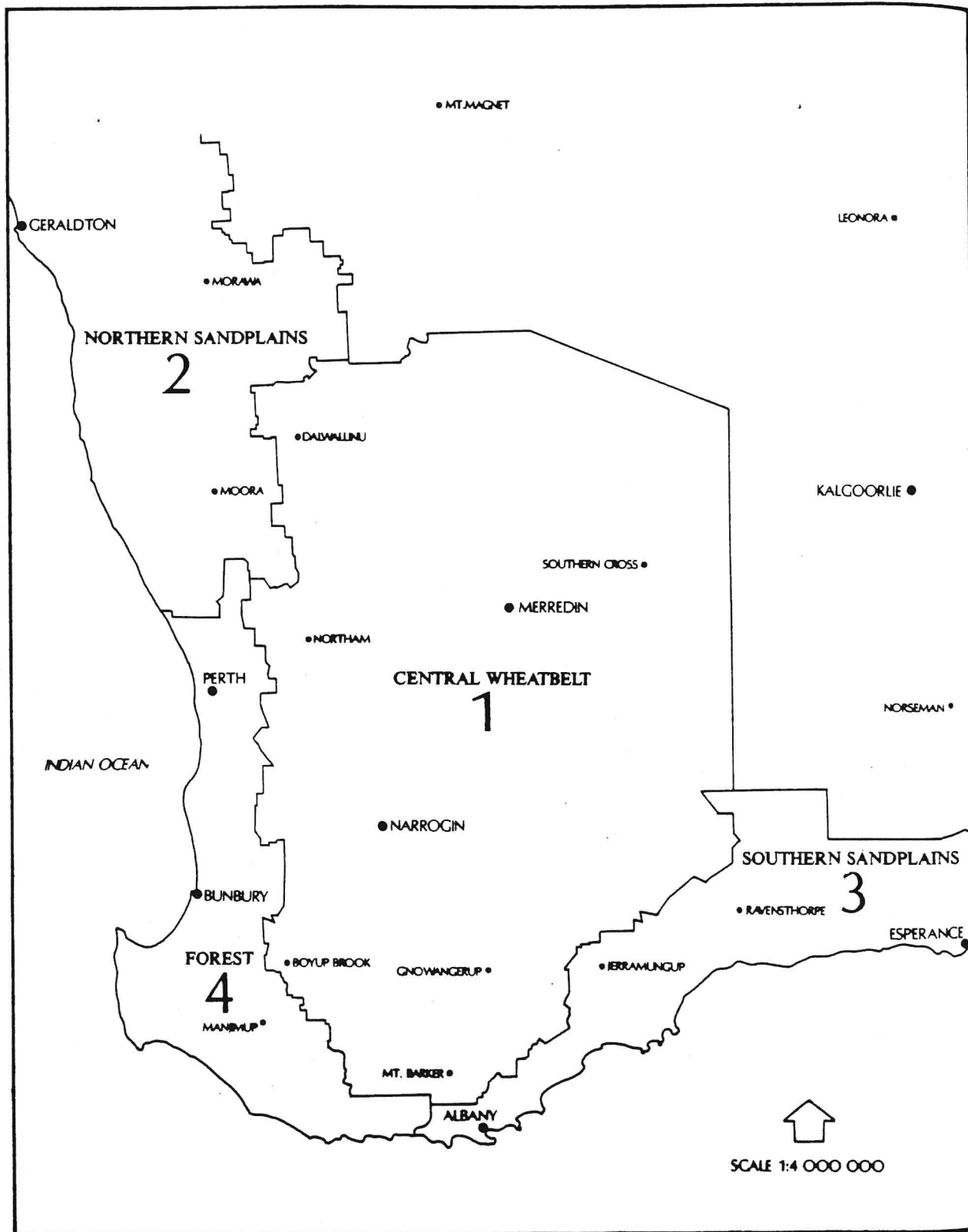


FIGURE 2  
Boundaries of Regions used for the Remnant Protection Scheme.

Except for some cases where local people ranked remnants on their perception of soil conservation value and ignored nature conservation values, this part of the assessment was well done. Many helpful comments were provided by local assessors, and their rankings provided a good check for the State-wide assessment. As would be expected, the local rankings proved particularly useful in discriminating between nominations from one area, but were not particularly useful in comparing nominations from different areas (see also the section below in which nominations are analysed).

State-wide Assessment Process

To rank nominations on a State-wide basis a number of procedures were followed. Firstly, all nomination forms were allocated a unique nomination number, checked, and the data interpreted into a format suitable for computerisation (Appendix 3). A new habitat category (Class 4A) was defined at this stage to encompass vegetation significantly disturbed by grazing. Class 4B (see Appendix 3) is equivalent to the Class 4 defined on the nomination form.

The new category was formed to recognize that grazed country, if fenced, may return to a near natural state. In fact this category was not required, although it may prove useful in future years.

The following general rules were used before nominations were analysed:

1. Nominations which had not been signed by an LCDC member or Department of Agriculture officer were rejected.
2. Nominations which included narrow strips along fence lines, or very narrow strips within paddocks were rejected.
3. Nominations which included narrow strips along creek lines were accepted, however, many were given a doubtful rating on the basis of their perimeter to area ratio.
4. While every attempt was made to interpret poorly completed forms, where significant information was missing or very unclear, the forms were rejected.
5. Requests for fencing along boundaries between Government reserves and private property were rejected.

All nominations were checked by two people.

Nominations were ranked by computer into the categories [(A) best, (B) second best and so on] shown in Table 1. Within each category nominations were ranked according to their area of undisturbed vegetation. Nominations were allocated to the highest category for which they met the criteria given in Table 1.



The categories used to rank the nominations were based on the following premises:

- (a) classes of vegetation used are an accurate measure of nature conservation value;
- (b) specific classes of vegetation are equivalent in value across the four regions defined for the Scheme;
- (c) 30 hectares is a meaningful cut-off point based on the work on mammals by Kitchener et al (9);

TABLE 1: Categories used for ranking nominations. Category A is considered better than Category B and so on. Areas were ranked within each category according to undegraded area.

- |   |
|---|
| (A) Areas with >30 hectares Class 1 vegetation  |
| (B) Areas with >10 <30 hectares Class 1 vegetation  |
| (C) Areas with >30 hectares Class 2 vegetation  |
| (D) Areas with >4 <11 hectares Class 1 vegetation <u>and</u> a total undisturbed area >15 hectares  |
| (E) Areas with >10 <30 hectares Class 2 vegetation <u>and</u> a total undisturbed area >30 hectares |
| (F) Areas with >30 hectares Class 3 vegetation  |
| (G) Areas with >4 <11 hectares Class 1 vegetation and a total undisturbed area >0 hectares          |
| (H) Areas with >10 <30 hectares Class 2 vegetation and a total undisturbed area >0 hectares         |
| (I) Areas with >4 <11 hectares Class 2 vegetation and a total undisturbed area >15 hectares         |
| (J) Areas with >10 <31 hectares Class 3 vegetation and a total undisturbed area >30 hectares        |
| (K) Areas with >4 <11 hectares Class 2  |
| (L) Areas with >4 <31 hectares Class 3  |
| (M) Areas with rare flora/fauna   |
| (N) Areas with >0 hectares Class 4B vegetation  |
| (O) Areas with >0 hectares (but no 4B) 4A vegetation  |
| (X) Areas rejected  |

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- (d) a point is reached where the actual area of vegetation becomes more important than the class of vegetation - for example 30 hectares of Class 2 vegetation has more value than 11 hectares of Class 1 vegetation;
  - (e) the area sub-divisions used between 0 and 30 hectares define meaningful categories with respect to nature conservation values; and
  - (f) nomination forms were filled in with a reasonable degree of accuracy.

The degree to which these premises are acceptable will be researched further over the coming twelve months. Certainly a reading of the State-wide print-out revealed no obvious anomalies. Furthermore, eight small nature reserves were ranked:

- (i) subjectively by an expert;
- (ii) by using the RVPS forms; and
- (iii) by using a more complex process (see Appendix 4).

It was found that there was relatively close agreement between assessments, particularly the two objective methods which differed only because the "complex" assessment gave more weight to the presence of a plant of restricted distribution. This suggests that the assessment procedures used for the RVPS are reasonable and could only be improved by excessively complicating the nomination form. Future research will examine this aspect and the validity of premises (a-f) listed above.

Following the State-wide ranking by computer, it was intended to have CALM officers assess in the field all nominations that were doubtful or within 10-20 places of the proposed cut-off point for funding. This assessment process would have used the more complex form (Appendix 4) referred to above. However, no time was available to undertake this field assessment. It may be included in future years of the RVPS.

The ranked nominations were then submitted to the State Soil Conservation Advisory Committee. The Committee supported the rankings provided by CALM, made decisions concerning specific nominations where guidance was required, and decided that nominations should not be fenced at the time they are approved for funding by the Ministers (that is no retrospective payments).

After adjusting the State-wide ranking according to the decisions made by the State Soil Conservation Advisory Committee, the successful applications were recommended to, and approved by, the Ministers for CALM and Agriculture.

CONDITIONS ON SUCCESSFUL NOMINATIONS, MONITORING REMNANT CONDITION

Successful applicants were sent fencing contracts by the Department of Agriculture. Funds were disbursed to those signing contracts, and fencing will be checked by either an officer of the Department of Agriculture or an LCDC member to ensure contracts have been met.

It is intended to establish photo-points on remnants accepted under the Scheme so that remnant condition can be monitored. Guidelines placed on the management of remnants are that the land-owner will not allow, and not themselves:

- (a) remove vegetation, soil, stones, sand, rock or gravel;
- (b) damage or destroy any plants;
- (c) interfere in any way with the water supply;
- (d) disturb any native fauna;
- (e) graze any livestock;
- (f) drain or clear any part;
- (g) erect any buildings;
- (h) deposit or leave any offal, refuse, rubbish or litter.

Remnants will be maintained according to these guidelines for a period of 30 years. This undertaking will be registered against the landholder's title as a voluntary heritage agreement. Diagrams showing the boundaries of each remnant will be prepared from aerial photography and LANDSAT imagery. Currently the Department of Agriculture has completed computer digitisation of remnant vegetation boundaries in much of the South West Land Division. LANDSAT imagery will be used to monitor any changes in remnant boundaries.

On-going monitoring of remnant condition is the responsibility of the Department of Agriculture, but LCDCs and CALM officers will assist as appropriate. Both CALM and the Department of Agriculture will provide advice on remnant management.

ANALYSIS OF NOMINATIONS - 1988/89

Some 350 nominations were received for the 88/89 round of offers. After late entries were excluded, 336 entries remained. Of these, a further 95 entries were rejected either because they did not meet criteria for acceptance (for example they were less than five hectares in area, or totally degraded); included areas which were unacceptable; or were uninterpretable. Many nominations in the last two categories would be acceptable if they were re-written and re-nominated excluding degraded and poorly shaped sections.

Of the remaining 241, the first 150 nominations were within the initial cut-off point for funding and were offered contracts for fencing. This represents 62% of the acceptable nominations.

110 of the 150 successful applicants signed contracts and accepted the fence subsidy. These total \$290 000 which represents 360 kilometres of 50% subsidised subsidised fencing at \$800/kilometre. This rate is based on a materials and labour cost of \$1 600/kilometre.

It was expected that 25% of those offered nominations would fail to take them up, and the final subsidy total is within \$10 000 of the \$300 000 available for expenditure during 88/89.

Fortuitously, the initial cut-off point lies close to the bottom of category L (see Table 1), a particularly appropriate position as the value of nominations below are increasingly questionable.

A statistical analysis of nominations by regions (see Figure 2) is given in Table 3.

The preponderance of nominations have come from the most highly cleared parts of the State. Given that the highly cleared areas are those with the greatest nature and soil conservation problems, this result is very satisfactory.

Two further statistics which are of interest are, firstly, that out of 56 LCDCs with nominations 46 obtained at least one successful nomination. Secondly, the preponderance of nominations locally ranked 1 or 2, received subsidy offers (Table 4). In fact of the 241 nominations accepted into the ranking process, 56 of the 63 applications ranked "1" were offered a subsidy. Thus there is a strong correlation between nominations being granted a subsidy and those nominations given a high (rank 1) local ranking. One could not expect a closer correlation between State rank and local rank given:

- (a) some groups had only one nomination, or gave two entries equal first. Therefore there are more number one ranks than any other and they are very variable in quality;
- (b) some groups submitted many good nominations;
- (c) local assessment did not involve scoring nominations, therefore there is no direct, numeric correlation between first ranked nominations.

Finally, farmers obviously had some difficulty completing the nomination forms. This is not surprising given that the forms are complex and were not accompanied by a glossary. These issues will be addressed before the next round of nominations are sought, and in fact a new draft nomination form has already been prepared.

TABLE 3: Statistical analysis of nominations by region.

REGION	PARAMETER				Length (km) of Fencing Subsidised Nominations
	Number of Nominations	Percentage of Nominations Which Were Subsidised	No. of Subsidised Nominations	Area (ha) of Subsidised Nominations	
1. Central Wheatbelt	189	37%	69	3862 mean = 56 median = 30 range = 9-332	173 mean = 2.5 median = 1.8 range = 0.5-10
2. Northern Sand Plains	38	39%	15	1898 mean = 126.5 median = 42 range = 15-600	86 mean = 5.8 median = 2.8 range = 1.0-25
3. Southern Sand Plains	82	24%	20	1707 mean = 85.4 median = 50 range = 10-320	85 mean = 4.3 median = 3.9 range = 1.3-10
4. Forest	22	27%	6	388 mean = 64.7 median = 141 range = 15-200	15 mean = 2.5 median = 1.4 range = 1.0- 5
TOTALS	331*	33%	110	7855 mean = 71.4 median = 40 range = 9-600	360 mean = 3.3 median = 2.0 range = 0.5-25

\* Actually 336, but data on 5 nominations did not allow computer to sort by region

TABLE 4: Distribution of local rankings in comparison with State rankings. Note that nominations 242-336 were rejected therefore they are not shown. Also, cut-off point for accepting nominations for a subsidy is State rank 150.

LOCAL RANK	STATE RANK			Not Offered Subsidy	
	Offered Subsidy			151-200	201-241
	1-50	51-100	101-150		
1	20	16	20	5	2
2	11	6	6	9	9
3	7	3	6	11	5
4	3	3	7	6	1
>4	5	15	10	11	17

#### CONCLUSIONS

The true worth of the RVPS must be judged by four criteria:

- (a) the nature and soil conservation values of the areas fenced under the Scheme;
- (b) the cost per hectare of the Scheme compared to other schemes with similar objectives;
- (c) whether or not the conservation values of the remnants are maintained or enhanced throughout the 30 year period of the voluntary heritage agreement; and
- (d) farmer acceptance of the RVPS as a useful means for them to achieve their local, land conservation objectives.

Of these the first, judged by the farmers descriptions and comments by staff from CALM and the Department of Agriculture, has been satisfactorily achieved. There are outstanding areas included within the RVPS, and the remainder will, at the minimum, contribute to regional and local nature and soil conservation. Research proposed by CALM over the coming 12 months will more accurately assess the nature conservation values of the remnants.

With regard to the second criterion, the expenditure of \$290 000 to protect 7 855 hectares for a 30 year period translates into a cost of \$37 per hectare. This is comparable with the 15 000 hectares obtained under voluntary Heritage Agreements in South Australia over the two years to January 1983. These resulted in commitments of \$30 per hectare (1).

It will be some time before the achievement of the last two criteria - maintenance and enhancement of conservation values, and farmer acceptance of the Scheme - can be assessed. However, success in this area will be crucial to the success of the RVPS and will provide a challenge to CALM and Department of Agriculture officers with regard to monitoring and the provision of management advice.

Furthermore, a number of areas require research. These include the accuracy with which farmers have completed nomination forms, and the categories and classes used for ranking nominations. At least some of this research will be undertaken in the coming 12 months.

In conclusion, the RVPS has proved, despite the haste with which it was implemented, a successful means of providing medium term protection for remnant vegetation with conservation values on private land. However, there are a number of aspects - such as the format and content of the nomination form, and the promotion of the Scheme - which can, and will, be improved.

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