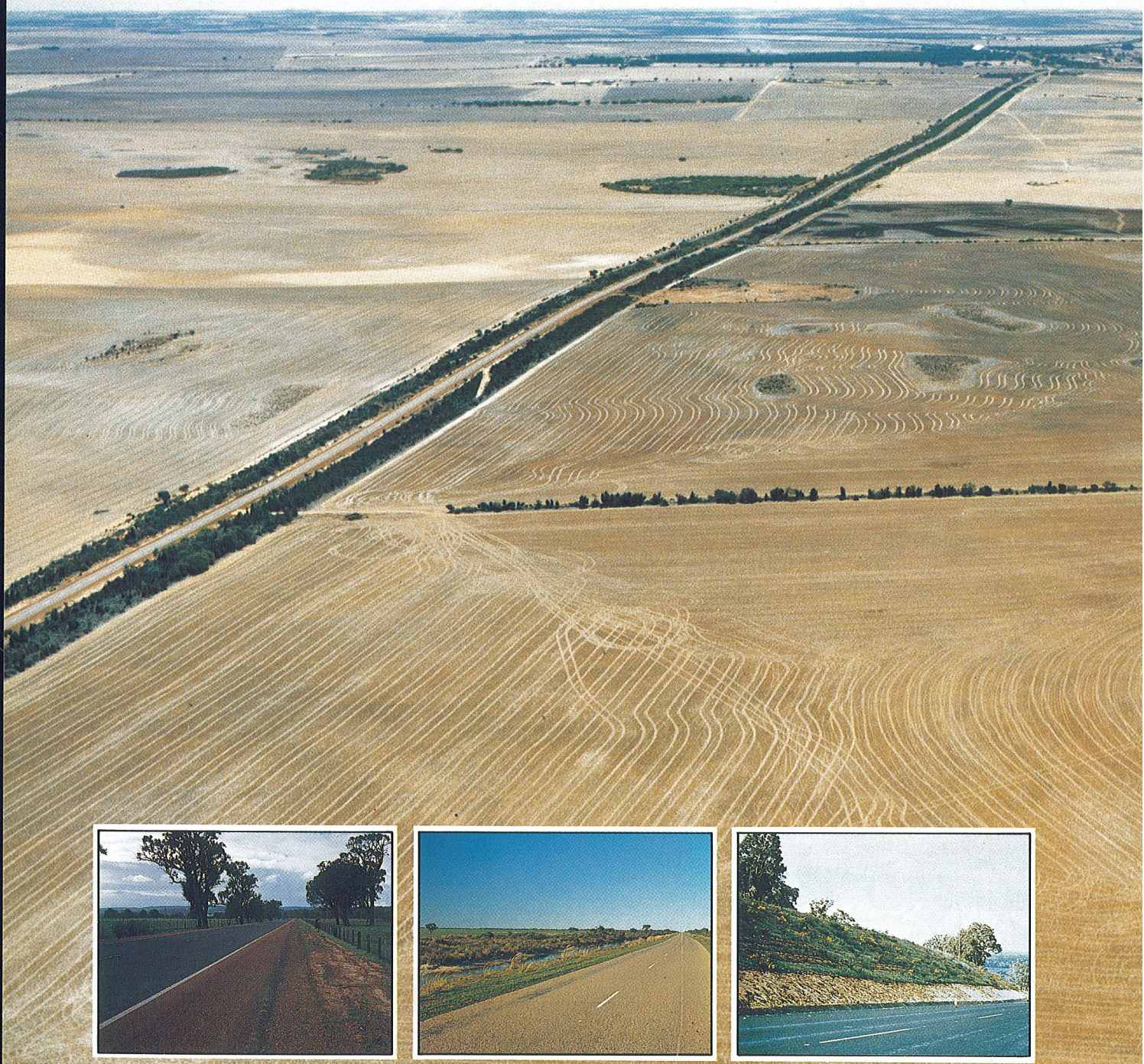
ROAD VERGE CONSERVATION COMMITTEE OF WESTERN AUSTRALIA

ROAD VERGES IN WESTERN AUSTRALIA



Authorized by Mr B. J. Beggs. Chairman of the Road Verge Conservation Committee and Conservator of Forests

Within the National Tree Planting Programme the care of trees and shrubs on road verges plays an important part.

Roadside Verges

The ''road verge'' is taken to include that portion of a road reserve that remains on either side of a road after construction of the road surface and its drainage systems.

Roads tend to run in a series of straight lines, crossing geological formations, land forms and vegetation boundaries, creating a cross-section of the countryside.

Road verges are the landscape that all road travellers see, and they may be the best or the worst part of the roadway landscape. They are important therefore, to the entire travelling public, to the road builders, to the neighbouring landowners and to the birds and animals that live in or travel along them.

The condition of road verges in Western Australia varies widely. Some are corridors of wildflowers in season, others are focal points for litter, weeds and erosion. All classes of verge are important.

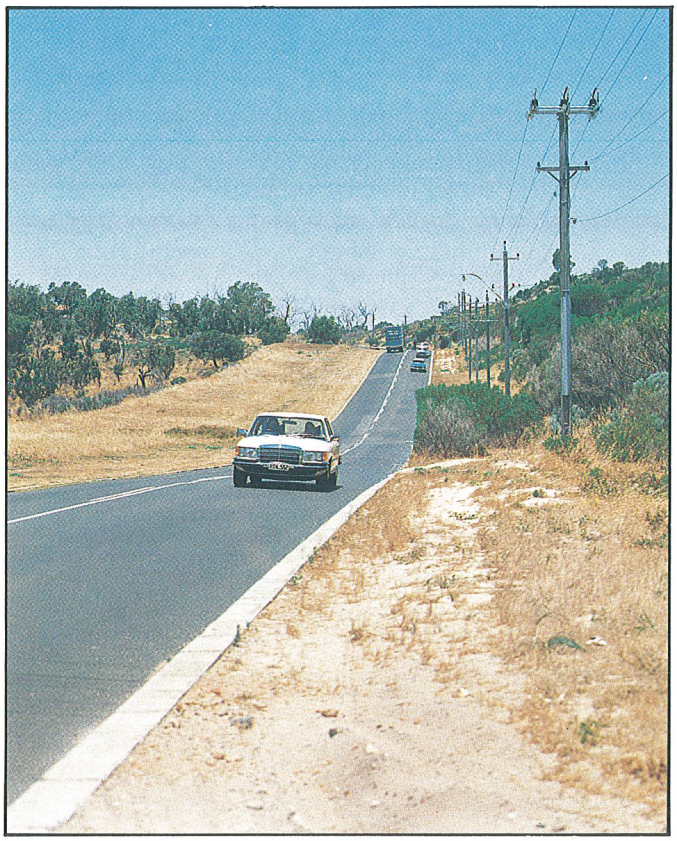
Many thoughtless or careless actions can damage roadside flora —indiscriminate burning, firebreak construction, chemical sprays, invasion by weeds — even the simple act of driving machinery along the verge, can do serious damage.

With sensible management, verges of reasonable width can retain viable populations of native plants for a very long time, while verges where the flora has been damaged can probably be repaired, given time and assistance.

The challenge to retain our famous wildflowers and our unique vegetation along a significant portion of roads rests with us all. Local government and State authorities can do much of the work, but without widespread public co-operation, much of this work will be wasted.

Since its establishment some 14 years ago, the Road Verge Conservation Committee, acting in an advisory role, has had an influence on the manner in which verge flora is managed and the pages that follow give an indication of the progress that has been made.

B. J. BEGGS
Chairman.



Road verges often form the first impression of the landscape for visitors to Western Australia.

This report reviews the work of the Road Verge Conservation Committee over the past 14 years and concludes:

- Wider road reserves are desirable for effective rural conservation programmes.
- Co-operation from public utilities services has been at a high level.
- There is a continuing need to set aside suitable roadside flora areas managed by a competent authority.
- Road verge burning has decreased and controls on it should continue.
- A research programme is needed on the effects of fire, re-establishment of flora in degraded areas and tolerance of native plants to herbicides.
- The committee's involvement in flora protection problems on road verges will continue.

The Road Verge Conservation Committee was convened at the request of Government, by the then Conservator of Forests, in December, 1969.

The request to form a committee arose from strong public criticism in describing the poor conditions of flora on roadside verges in many parts of Western Australia with particular reference to:

- unsightly debris left after road contruction and the work of other authorities
- damage to native flora by engineering works, exotic plants, vermin control methods and regular verge burning.

Because of the wide range of causes or suspected causes of road verge problems, the committee membership was chosen to represent those State and Commonwealth organisations that have an impact on road verges. At a later stage, membership has included the Department of Fisheries and Wildlife.

Representation included —

Forest Department
Soil Conservation Service
Western Australian Herbarium
Country Shire Councils Association
State Energy Commission
Main Roads Department
Telecom Australia
Lands and Survey Department
Agriculture Protection Board

Following a number of meetings and some field visits, the report of the committee and its recommendations were presented to Government in November 1970.

This document reviews some of the philosophy of the report and the level of progress made with respect to the recommendations it contained.

In wheatbelt areas of Western Australia the road verges are often the only remaining strips of native flora.

Roads — the purposes they serve

Road reserves were originally provided for the passage of people and materials, by rather primitive means. In more recent times, road reserves have been called upon to accommodate high speed traffic, telecommunications, power, water, recreation and amenity facilities.

These changes have substantially reduced the width of verge that remains, thus placing enormous pressure on the natural vegetation and limiting its ability to survive.

Until relatively recent times, all road reserves in Western Australia were established at a width of from 20.1 to 40.2 metres (1 to 2 chains). In practice, therefore, most roads in the older settled districts of the southern half of the State are narow reserves, even those that have since become major roads.

Since 1946, rural road reserves in new agricultural areas have been designed with widths of 60, 80, etc. up to 400 metres. The construction of highly engineered roads on these reserves ensures the retention of a wide and uncleared road verge, which is more likely to sustain natural vegetation in the long term. Even so, it is important to remember that the primary function of road reserves is still that of providing for the passage of people and their vehicles or materials.

Classification of Roads

There are nearly 164 000 kilometres of road reserves in Western Australia of which some 110 000 kilometres form the Developmental and Important Secondary road system under the care of local authorities.

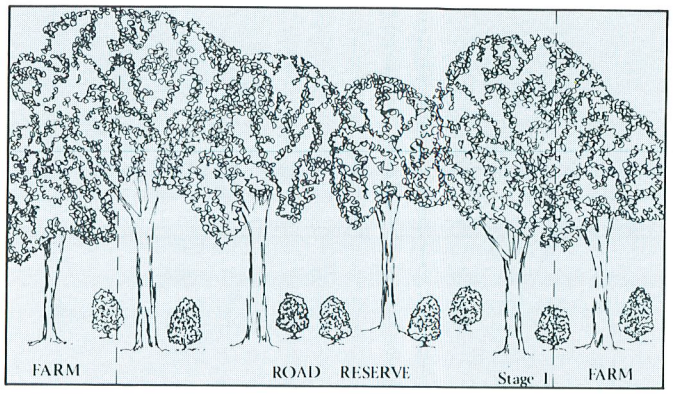
An additional 25 000 kilometres of the system are forest roads controlled and maintained by the Forests Department. These roads are generally not built to a high standard and present no serious road verge problems.

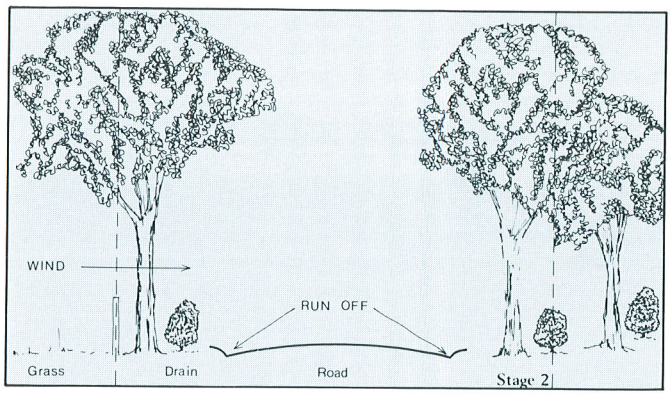
The Main Roads Department accepts responsibility for 15 000 kilometres of highways and main roads for which the Commissioner of Main Roads accepts responsibility for management of the entire road reserve.

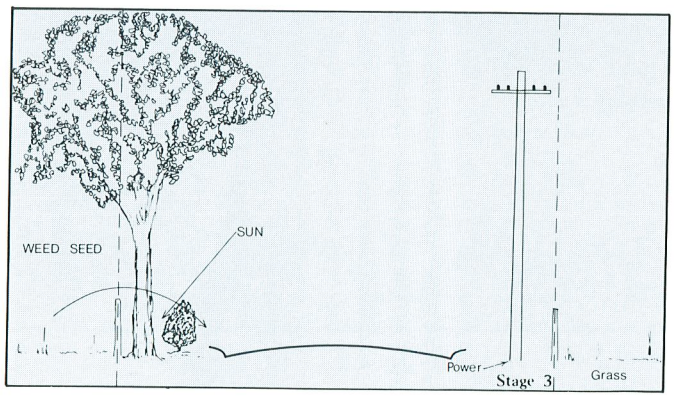
In order to concentrate its attention on the roadsides of interest to the largest section of the community, the committee has dealt with main routes between population centres, and roads of importance to the tourist industry.

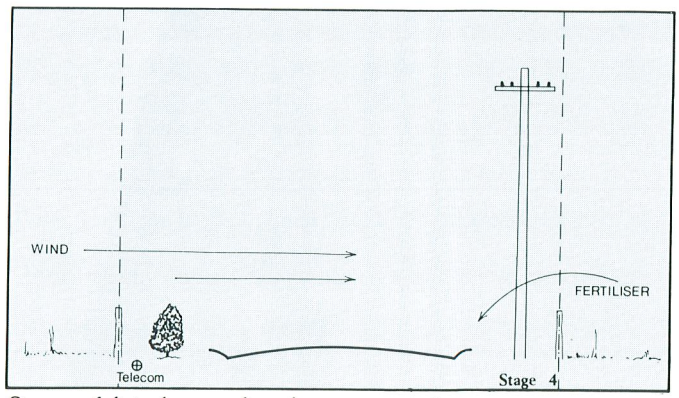
In effect this meant that attention was concentrated on main roads in the more densely populated areas of the South West and Eucla land divisions. Even within this area, a number of major roads that pass through National Parks, Wildlife Reserves or State Forests, were considered to need no immediate attention and so studies to date have been confined to roads that pass through mixtures of Crown and private land in the south-west and Esperance regions.

Roads in W.A. open up the expansive inland.









Stages of disturbance of road verge vegetation.

Verge Environment

The plants within any road verge experience unique environmental conditions with respect to climate, physical impacts and fauna influence. In the case of rural road verges these conditions may include deposition of litter, exhaust gases, physical disruption, extreme wind and lateral insolation, periodic burning and so on. Under these influences, a rapid change in the character of its native vegetation is inescapable unless some form of protective management is established.

For most common road reserve widths of 20 and 40 metres, it can be seen that agricultural development, road construction and provision of public utility services have a marked effect on the roadside verge, as shown in the diagram.

Stage 1 represents the undisturbed condition of mallee or low woodland with a semi-continuous canopy and a relatively stable relationship between the plant association and the environment.

Stage 2 may occur shortly after agricultural settlement begins. Immediately changes begin to occur. Water is redistributed by the road surface and table drains, the vegetation on one side of the road at least is subjected to increased wind exposure, increased lateral sunlight and possible soil erosion effects from adjoining fields.

Stage 3 occurs when intensive agricultural settlement and utility services, such as electric power transmission necessitate removal of vegetation on one verge. The single remaining verge is now fully exposed to wind, rain, sun scorch, abrasion from wind blown particles, invasion by agricultural plants and weeds, deposition of litter and imposition of fertilisers.

Stage 4 is when whatever persists on the remaining verge is disturbed by a subterranean cable. It is by this stage that weed growth may have forced the farmer or shire council to burn the verge regularly, and in this almost totally new environment it will be only the occasional plant that persists.

Nevertheless, the remarkable persistence of trees and some shrubs in narrow verges that are completely over-run with annual grasses and have been regularly burned for more than 30 years, can still be observed from time to time.

Persistence is the operative word since in none of these cases to date, has there been any sign of new plants regenerating. Once the older perennial plants have gone they have little chance of replacement without deliberate assistance of some kind. Detailed scientific investigation is essential to find the means to obtain regeneration on degraded verges in a wide range of soil and climatic conditions. Meanwhile, pilot studies by the Main Roads Department have shown that some species at least can be regenerated merely by the exclusion of fire for several years.

Protection Techniques

Over the decade since 1970 the Main Roads Department has developed a radically different road construction philosophy and techniques that can be applied in most situations, but which are most effective on road reserves wider than 60 metres.

The single most important factor is retention of the surface soil. The topsoil contains most of the organic matter, small roots and seeds of the indigenous flora, optimising the chances of regeneration. The technique requires that after careful removal of above ground vegetation, the surface soil is stockpiled near the construction work and at the completion of earthworks, the stockpiled material is spread along the verge. The faces of cuttings are "stepped" in a series of shallow strips onto which the topsoil is spread.

The application of these methods to road construction and the rehabilitation of borrow pits has been successful on sites over a wide geographic and climatic range. These techniques have been explained to shires and other road building authorities in a series of courses conducted by the Main Roads Department.

The regeneration of native plants on treated verges does not necessarily re-create the original ecotype, nor will the new combination always be a viable and stable plant association, but for a great number of sites the new "crop" quickly hides the scars of road construction and produces an interesting range of species endemic to that area.

A similar technique is applied when major roads are constructed through woodland or forest, although regeneration of tree species close to the road requires attention to retain a margin of safety for vehicles that leave the road accidentally.

Road verges require maintenance and protection. This often involves the "stepping" of the road cutting and the refilling of the steps with topsoil to allow the regeneration of vegetation as illustrated in the photographs above.

Weeds and introduced grasses often dominate road verge vegetation, especially in areas adjacent to farmland, where the verge is narrow and the soil contains heavy clay (top and centre).

Lateritic and gravelly soil and wide verges discourage the growth of weeds.

Infiltration of Weed Species

One of the problems for native flora on road verges, and particularly on narrow verges, is that of invasion by weeds, the seeds of which may be spread by birds or animals moving along roads and by wind dispersion from adjacent farmland. In districts where fertiliser is spread by machine, and especially by aircraft, there is an additional factor which aids the growth of weeds. Where soils are of heavy texture (clays) the fertilisers tend to accumulate, benefiting the weeds and discouraging the endemic species.

Vigorous ground flora may offset this invasion, but open woodlands with grass or ephemeral ground flora are very prone to weed invasion. In turn, this may necessitate a regular, even annual firing of the verge for protection of farmland. There are, however, some encouraging results where the exclusion of fire has produced a resurgence of native plants. There is an urgent need for research into the options available for reducing the impact of weed species while at the same time encouraging the growth of native plants. The alternatives to fire may include chemical sprays, selective fertilisers, physical removal by cultivation or strip grazing.

Vermin

It is generally accepted that large tracts of natural vegetation, such as are found in National Parks and Wildlife Reserves, have great aesthetic value, and help to ensure the survival of flora and fauna. Smaller reserves and the vegetation of roadside verges which can often link up with them are also recognised as important in conservation of wildflower species and native animals.

Unfortunately, vegetation also provides excellent cover for rabbits which will burrow in the verge while feeding on crops of adjoining farmland. It is often argued that the first step in successful eradication of rabbits from roadside reserves must be destruction of the warrens. Western Australian experience has shown that if rabbit feeding grounds in the paddocks are effectively baited, the rabbits living in the road verge can easily be controlled.

Depending on one's viewpoint, road verges can be described as "harbours for vermin" or "refuges for fauna". In practice both statements have some validity, but the role of verges as corridors for movement of birds and animals is well established. Small mammals use verges as cover while moving from one sanctuary to the other, and the smaller bird species use them, especially the trees, for the same purpose. The worsening of mistletoe infestation alongside roads in some agricultural areas is thought to have resulted from this pattern of bird behaviour.

Fire Protection

The management of fire along roadsides is a complex subject that is poorly documented and often misunderstood.

A road verge with vigorous native vegetation does not require frequent burning, and is often not highly flammable. Conversely, a verge that is heavily infested with grasses and has been frequently burnt, will require continued burning at the expense of the remaining native species. If fire can be excluded for longer periods, native plants may re-establish, but much research is needed to define specific needs for a wide range of site and vegetation conditions.

In the short term the committee has recommended a decrease in the regularity and intensity of burning and some positive results have been achieved:

- the Commissioner of Main Roads now controls the whole road reserve on gazetted main roads, and permission to burn the verge must be obtained through his Department;
- the Road Verge Conservation Committee has submitted a Road Verge Burning Policy to local government and this policy has been adopted by a majority of shire councils.

The main features of the policy are as follows:

GENERAL

1. The establishment of firebreaks on road reserves should be strongly discouraged.

CONDITIONS OF APPROVAL FOR FIREBREAKS WITHIN ROAD RESERVES

2. In special circumstances the Local Authority or the Main Roads Department, depending on the Authority controlling the reserve, may give approval to the provisions of a firebreak within a road reserve. The conditions applicable to such approvals are:

   (a) The land owner or occupier provides and maintains a firebreak within the property and along the fenceline for which an application for firebreak within the road reserve is being submitted. Provision of a firebreak within the road reserve does not relieve the land owner or occupier from responsibilities stipulated in the Bush Fires Act.

The establishment of firebreaks on road verges should be strongly discouraged.

(b) Width of firebreak to be maximum of two metres and located alongside the fence where practicable.

(c) The type of firebreak proposed is to be specified by the applicant.

(d) Approval will only be given for the initial provision of the firebreak. Subsequent maintenance of the firebreak is subject to further application and approval.

PROVISION AND MAINTENANCE

3. The responsibility for providing firebreaks within road reserves will rest with the adjacent land holder. The responsibility of Main Roads Department and Local Authorities would be limited to giving approval to the provisions of firebreaks within the reserve, the physical provisions and maintenance being the responsibility of the applicant.

As a result of Main Roads Department control of verges along major roads and the necessity for adjoining land holders to seek permission to burn the road verge, a significant reduction in the regularity and severity of verge burning has occurred. Similarly, verge burning in general has markedly decreased in many shires. It has not been possible to carry out extensive surveys of verge burning but even from casual observation, a big reduction in activity can be confirmed.

There will probably always be a level of conflict between the demands of property protection from fire, and of flora conservation along roadsides. The committee, however, believes that with the co-operation of road users, road builders and land holders, much of Western Australia's roadside flora can be conserved.

In the photograph below, approval may be given for an additional firebreak in the road reserve, provided that certain conditions are met.

Roadside Flora Areas

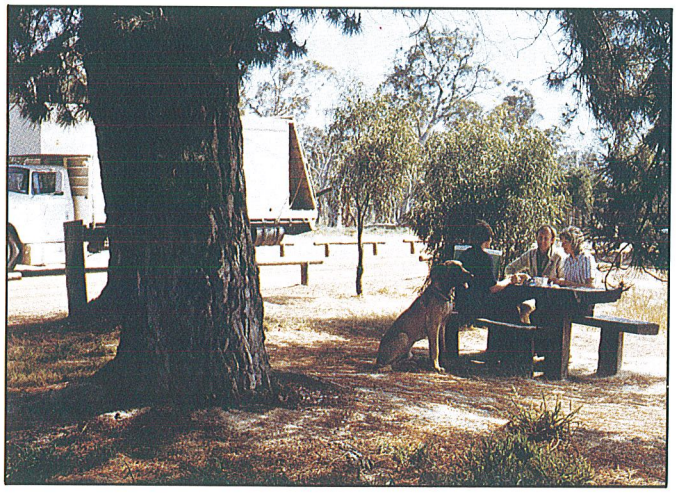
A sub-committee has initiated surveys of the verge flora on some important main roads, principally to develop a methodology for classification of verges, while also obtaining an indication of general verge conditions. This work can not go beyond a superficial study, until such time as full time professional staff is made available.

The sub-committee found that there are still considerable sections of roadway in high rainfall areas of the south-west, where the roadside flora remains in a viable, attractive condition. In addition, there are adjacent "A" class and "C" class reserves at intervals through most agricultural districts that complement the road verge flora. Comparison of recent aerial photographs with current ground conditions showed that the situation is fluid and rapidly worsening. In the wake of agricultural development much recent clearing has occurred and some small reserves have been alienated for neighbouring farms. This points to the need to accelerate special reservations of outstanding or unique verges and other reserves in close proximity, to establish roadside flora areas.

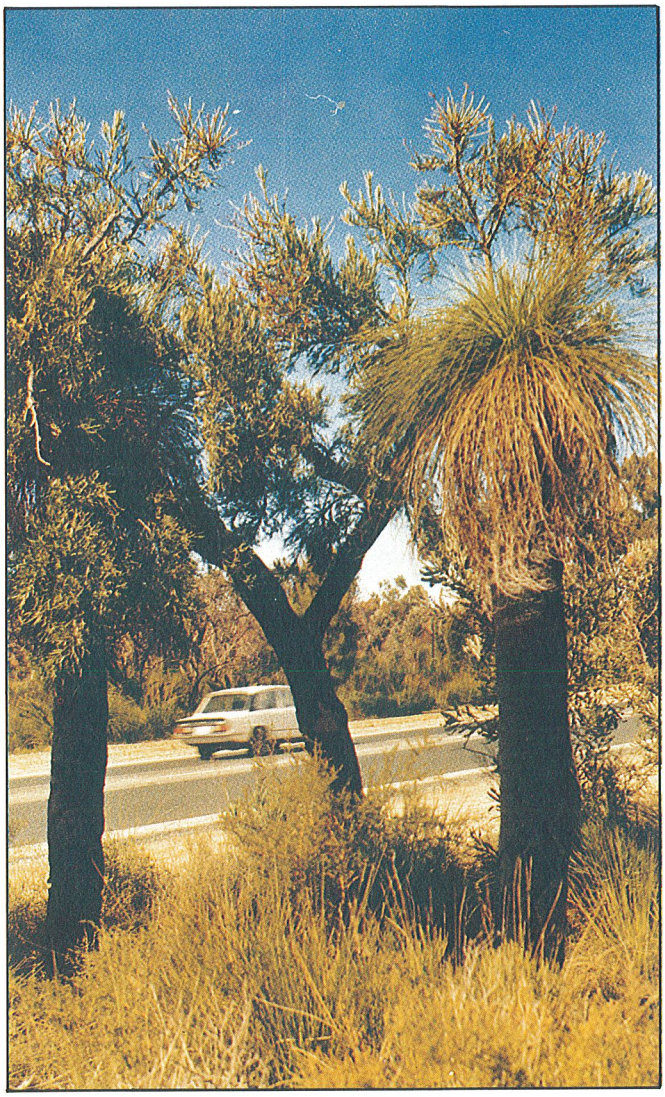
The committee is well aware of the constraints in such a process. A detailed analysis of land tenure and botanical composition is a large but relatively simple task. The complications arise when reservation is contemplated. Such action could involve resumption of private land, truncation of block boundaries, change of purpose for many reserves both unvested and vested, and finally the nomination of an authority prepared and able to administer and actively manage the reserves so created.

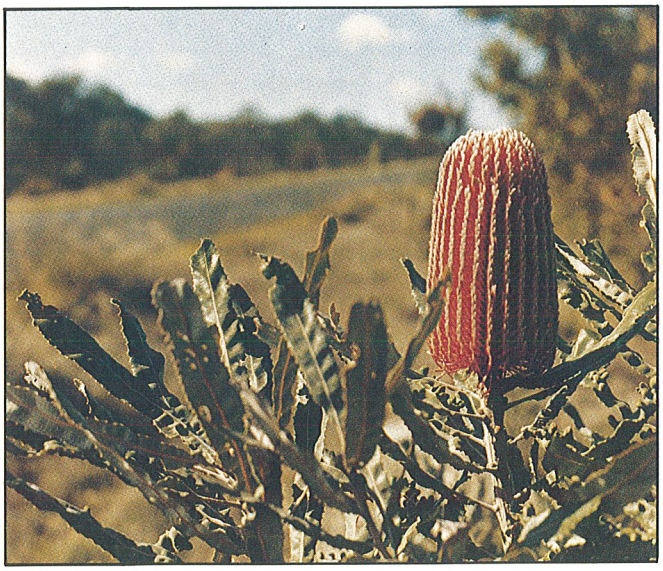
Roadside flora areas are seen as a vital part of the roadway flora management process. Areas that contain valuable native species could be absorbed into the road reserves system and managed to provide study areas, resting places, etc., in a pleasant environment of endemic plants. The areas might be selected for a variety of reasons including rare or endangered flora, aesthetic appeal, historical importance or geological significance. In due course, they could become informal study areas or rest areas for weary travellers.

Road side flora remains attractive and viable in some areas, especially in high rainfall regions of the south-west where road reserves are complemented by other, more extensive reserves.



Well vegetated road reserves make a pleasant environment when breaking the journey.





Public Input

Although the Road Verge Conservation Committee has not actively sought publicity since 1969, there has been communication with local government bodies and reciprocal enquiries for advice or guidance from several authorities. These enquiries have varied in nature and have all been followed up by members of the committee.

There have also been enquiries from individuals, generally with respect to the activity of Government Departments, but also requests for advice on choice of species and the planning of tree or shrub planting on or near depleted road verges.

The committee has also attended to problems referred to it by conservation groups.

While the Road Verge Conservation Committee is not a statutory body and has no full-time or part-time staff, all of these enquiries have been attended to, usually by members of the roadside flora sub-committee, which includes officers of the Main Roads Department, the Western Australian Herbarium, the Department of Fisheries and Wildlife and the Forests Department.

In general, committee members have been impressed by the co-operative attitude of State and Local Government officers with respect to road verge comments, and some authorities have adopted roadside treatment recommendations as their general policy. The committee also acknowledges the assistance provided by the Department of Conservation and Environment which handles many of the written enquiries about road verges and flora.

During 1979, a major activity associated with the W.A. Week Council was a Main Roads Department programme which planted some 40 000 seedlings of native plants along main roads in the settled districts. While this approach may not meet the demands of all conservation groups, it is seen to be a positive step towards beautifying some degraded road verges.

The Road Verge Conservation Committee favours the retention and re-establishment of native flora along road reserves. Plants such as the familiar blackboy and banksia are a welcome sight.

Progress

The 1969 report to Government incorporated eleven recommendations. Now, fourteen years later, it is of value to review these eleven points and to report on the level of progress made with their implementation.

Recommendation 1:

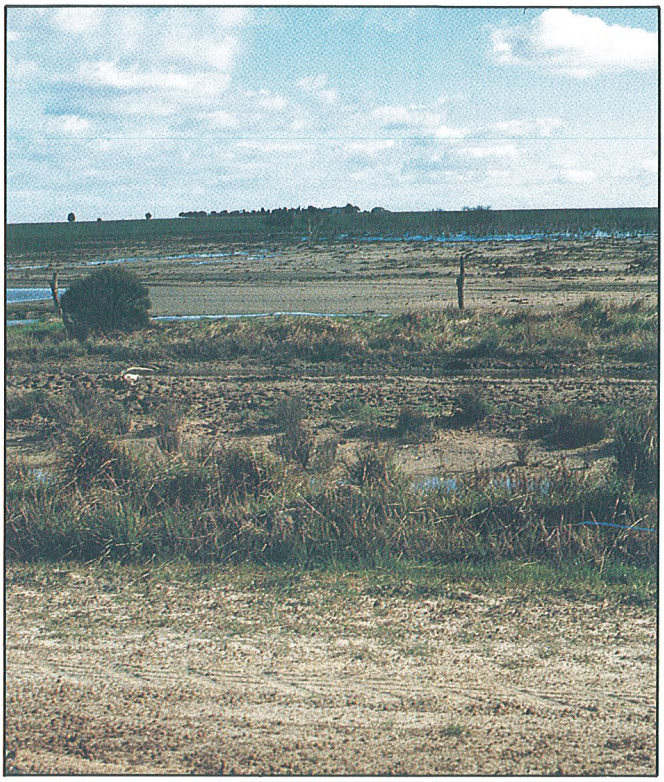
The Lands Department policy of creating 60 to 200 metre road reserves in new areas should be continued. This is now standard practice in new rural subdivision planning.

Recommendation 2:

Where wider reserves place an added burden on either individual farmers or the local authority in relation to vermin, noxious weed or fire control, Government assistance should be considered. To date no real evidence of added burden has been compiled and the subject of specific Government assistance has not arisen.

Saltbush planted on the road verge near Dumbleyung will highlight the verge at night and act as a cushion for motoring accidents.

Planting of vegetation stabilizes drifting sands on coastal verges.



Recommendation 3:

Roadside flora areas should be provided at intervals along existing narrow road reserves. These areas should be selected in Crown land where possible, but the resumption of suitable areas of private land should be considered where necessary AND

Recommendation 4:

A specialist committee consisting of a highway engineer, a botanist and a forester should be constituted to select and recommend suitable sites for these flora areas . . .

As reported above, pilot studies of selected roads have been carried out, but the sub-committee's task is not complete, nor is there any appropriate legislation by means of which such reserves can be set aside.

Road verge vegetation is difficult to establish in areas of salt-affected land (left).

Recommendations 5, 6 and 7:

Relating to the control of the whole road reserve on main roads by the Commissioner of Main Roads and to the demonstration of road verge techniques to other road authorities have been carried out in full.

Recommendation 8:

Public utilities should avoid road reserves wherever possible, but where such reserves are used the authority concerned should be responsible for satisfactory conservation and restoration . . . The record of the public utilities in the years since 1969 demonstrates a high level of co-operation by the State Energy Commission, Main Roads Department, Metropolitan Water Board, Public Works Department, etc. through greater attention to design and location of engineering works away from road reserves.

Recommendation 9:

Consideration should be given to co-ordinated planning of road verge burning operations to enable the problems of fire conservation of flora to be dealt with to the best advantage. Reaction to this recommendation has been in a different direction but has, nonetheless, been highly effective. The amount of road verge burning has been substantially decreased in the last twelve years due to the controls exercised by the Main Roads Department and to adoption of the Road Verge Conservation Committee guidelines by the majority of shires.

Recommendation 10:

That a research programme be implemented to investigate:

(a) the effects of season, periodicity and type of burn on native flora;

(b) the long term re-establishment of native flora on degraded road verges;

(c) the tolerance level of native species to herbicide sprays in general use.

This recommendation is regarded by the committee to be the most important, and a botanist commenced this research programme during 1980.

Recommendation 11:

Relates to a review of flora legislation. This has been achieved. The flora amendments to the Wildlife Conservation Act were proclaimed in 1980 and the responsibilty for protection of native flora now rests with the Department of Fisheries and Wildlife. The Road Verge Conservation Committee will continue its involvement with the specific and varied problems of roadside flora in Western Australia.

The recommendations of the Road Verge Conservation Committee should do much to improve existing road verges in tourist areas. To the left and right are two views of a popular tourist road that could have been better designed.

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